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U. S. Department of Agriculture

ANNUAL REPORT OF THE CHIEF OF THE BUREAU OF
AGRICULTURAL ECONOMICS

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF AGRICULTURAL ECONOMICS,
Washington, D. C., October 9, 1931.

SIR: I transmit herewith a report of the work of the Bureau of
Agricultural Economics for the fiscal year ended June 30, 1931.

Respectfully,

NILS A. OLSEN,
Chief of Bureau.

HON. ARTHUR M. HYDE,
Secretary of Agriculture.

Agriculture has felt this last year the full impact of the world-wide economic depression. Prices for farm products have declined drastically and in some instances have gone below previous bottom prices. Prices of commodities that farmers buy have also declined, but not in a corresponding degree. Taxes, furthermore, have remained at peak levels, and debts have yielded grudgingly in the face of dwindling farm incomes. As the causes of the present situation are many, so are the avenues of solution. It is a situation that calls for far-reaching adjustment in production and marketing, in credit, taxation, land utilization, and in State and National policies affecting agriculture. It is a situation that requires action by the farmer, the business man, and by National and State Governments. Some of these adjustments may be made more or less promptly, others only more gradually.

As a basis for action there must be adequate information for effective planning. The current facts of production, demand, distribution, and the like are indispensable, but much more is needed. The meaning of such facts must be ascertained and used as a guide to action. Much of the farmer's present plight grows out of past failures to understand the trends of the times and to avoid pitfalls. Continuous adjustments in the light of adequate information give promise of materially improving present conditions and of preventing their recurrence.

The activities of this bureau are directed at vital segments of the farm problem. There is scarcely an economic phase of agriculture that is not comprehended in its services and research. Its collection and dissemination of the current facts of production and distribution, its researches in price trends, outlook, farm organization, land utilization, credit, taxation, tariffs, transportation, standardization, de-

mand, marketing, standards of living, and agricultural history, all aim to provide information required by producers, distributors, consumers, and the public generally in formulating farsighted policies and effective programs of action. Its inspection and certification of farm products and its warehousing and regulatory activities facilitate the processes of marketing farm products.

The current fact-collecting services of the bureau have been measurably strengthened at home and abroad. The estimates in the field of crop and livestock production have grown in scope and frequency until now an average of 65,000 separate State and United States estimates covering 91 crops and classes of livestock are issued annually. The expansion in the dairy, fruit, truck, and canning crop estimates has been particularly marked during the year. Special research has led to improvement in the technic of crop and livestock estimating. Considerable progress has been made in reporting the quality of crops as produced. This type of service is perhaps best represented by the cotton grade and staple estimates.

The market news service is no less important as a source of current information on shipments, receipts, prices, market conditions, and other facts required in successful marketing. In the span of 16 years this service has grown until it covers most of the important commodities in 40 central markets of the country and in many important producing areas. The reports are flashed daily over 10,500 miles of leased wire, announced from more than 100 radio stations, and appear in mimeographed and printed reports bulking annually to millions of copies.

This year has witnessed also a material expansion of the bureau's fact-collecting activities in the foreign field. With the financial assistance of the Federal Farm Board and under the legislation recently passed by Congress, the bureau has stationed additional representatives to report on conditions of competition and demand in the Mediterranean Basin, the Balkans, Argentina, South Africa, and Australia, and in other ways has strengthened its reporting work abroad. This expansion of the foreign agricultural service is in growing recognition of the influence that foreign conditions exert upon American agriculture.

Economic research is at the very heart of the bureau's work. It yields the conclusions upon which adjustments affecting agriculture can effectively be made. Increasing support for studies of the influences affecting supply, demand, and price has laid the foundation for the nation-wide outlook service of the bureau. Studies in farm management and organization are uncovering adjustments that may be made on individual farms in various parts of the country to reduce costs and to increase net profits. Land-utilization investigations are gradually providing the basis for more effective handling of submarginal lands. Investigations of taxation, credit, land value, and other economic factors point to needed adjustments in these several fields.

In the realm of marketing a national, and for some commodities an international, inspection and certification service has been built upon the standardization research of the bureau. Studies in the field of consumption and demand have gradually been broadened to provide a better base for orderly marketing. The bureau is also devoting an increasing amount of study to the marketing machinery and

the processes of agricultural marketing in order to discover possibilities of eliminating the losses and waste in distribution.

The standardization and inspection service of the bureau has continued to grow rapidly. The inspection of fruits and vegetables, for example, this year broke all records. An unusually large volume of cotton was classified by representatives of the bureau under the cotton futures act. There was also a marked increase in the activities under the cotton standards act. It is estimated that licensees of the department classed over 2,700,000 bales of cotton. No less striking were the developments in the warehousing field. It is estimated that over 50 per cent of the cotton crop is now handled annually in federally licensed warehouses and that nearly 400,000,000 bushels of grain pass annually through federally licensed grain-handling facilities.

In the regulatory field the most outstanding developments were in connection with the perishable agricultural commodities act passed by the last Congress. More than 1,500 complaints in the handling of fruits and vegetables were received, and of these more than one-half had been closed by the end of the year. A majority of these complaints alleged the unjustifiable rejection of shipments, failure to deliver without reasonable cause, or failure to account promptly. The larger number of the cases have been promptly settled through the intervention of the bureau without the necessity of formal proceedings.

DIVISION OF FARM MANAGEMENT AND COSTS

C. L. HOLMES, in charge

The Division of Farm Management and Costs has continued to study the business side of farming. Applied specifically to the individual farm, the work of the division is concerned with finding those cropping and livestock systems of farming that make the best use of the farmers' resources and pay best in the long run.

TYPES OF FARMING

The purpose of studies in types of farming is to determine what degree of regional specialization exists and what are the underlying forces which have caused groups of farmers to engage in the particular forms of crop and livestock organization. A further purpose is to evaluate the local resources available to the farmers and to analyze the utilization of these by groups of farmers.

In cooperation with the agricultural experiment stations, type-of-farming manuscripts were completed and published for Kansas, Minnesota, Michigan, and Texas. Studies are under way also in Missouri, Wisconsin, and Connecticut. In cooperation with the Iowa Agricultural Experiment Station, a study of the place of pasture in Iowa farming was also made.

FARMERS' RESPONSE TO PRICE CHANGES

Study of the causes which lie behind the changes made by farmers in their production programs and marketing policies was continued. An understanding of these causes is necessary in order to understand the current agricultural-production situation, to outline desirable

systems of farming, to anticipate future supplies, and to measure market prospects.

A manuscript dealing with the factors affecting the flax acreage in the United States and in the four important flax-producing States was published. In this study it was found that farmers may be expected to increase their flax acreage when the actual return from flax, as compared to that from spring wheat at the previous harvest time, and the prospective relative return at the current planting time are high, and a decrease is to be expected when the situation is reversed.

In a study of hog production and marketing it was found that the year-to-year changes in production can be best explained by the relation between prices of corn and hogs of from 6 to 30 months before, that hog weights change from season to season in response to the preceding summer's "corn-hog ratio," the current fall corn supply, and the proportion of the total United States supply marketed from the Corn Belt.

FARM POWER AND EQUIPMENT

Study of the utilization and cost of farm power was continued in cooperation with the Bureaus of Animal Industry and Public Roads and 10 State agricultural experiment stations in the central Corn Belt and Cotton Belt States. A report covering the survey in the Corn Belt States is now being prepared, and a number of the cooperating experiment stations have analyzed and prepared for publication the information for their own States. The Louisiana Agricultural Experiment Station has published a bulletin entitled "An Economic Study of Factors Affecting Farm Organization and Power Utilization of Sugarcane Farms." The Mississippi Agricultural Experiment Station has prepared a manuscript entitled "Farm Power in the Yazoo-Mississippi Delta."

The department issued Technical Bulletin No. 244, Harvesting Small Grain, Soybeans, and Clover in the Corn Belt with Combines and Binders. This bulletin compares different harvesting methods and these comparisons should be of value in assisting farmers who are considering the purchase of combines for harvesting.

CORN-HARVESTING METHODS

An analysis of data on methods and costs of harvesting corn was completed and a technical manuscript, giving in detail the quantities of the cost elements used in harvesting corn, has been prepared for publication by the Illinois Agricultural Experiment Station. A manuscript on methods and costs of filling silos and one on husking corn in the field were practically completed for publication in the Farmers' Bulletin series by this department.

The growing use of the mechanical corn husker and of the field-silage harvester are examples of the substitution of power and equipment for man labor on farms. An average of 5.44 hours of man labor were used per acre in husking corn by hand on 174 farms during the period 1920-1928. On 102 farms an average of 2.72 hours of man labor was used per acre in husking with 1-row huskers, and on 64 farms on which 2-row machines were used an average of 2.21 hours of man labor were used per acre in 1928 and 1929. Man labor made

up 65 per cent of the total estimated cost of hand husking compared with 25 per cent when machines were used. During these periods the average total cost of husking by hand was about 10.5 cents per bushel; it was 8.3 cents when 1-row huskers were used and 6.6 cents with 2-row machines.

In 1929 the average cost of filling silos with stationary cutters on 47 farms was \$1.29 per ton, where the machines were owned by the operators, and \$1.37 per ton, where custom machines were hired. On 88 farms where field silage harvesters were used the average cost was \$1.22 per ton. While the difference in average cost of filling is not great, smaller crews are required in filling with the field harvester, less total labor is required, and there is less of the hard disagreeable work usually associated with silo filling. The maximum capacity of the field harvester is considerably less than that of the stationary cutter, a limiting factor where several silos are to be filled during a season.

THE APPLE INDUSTRY

Preliminary reports covering the varieties and ages of trees now in commercial and farm orchards in each of 25 States were published and a summary report containing tree statistics for a group of 41 States was issued. Additional field work covering tree statistics for approximately 500 Ohio orchards was completed. The results of this project have proven particularly helpful in determining the outlook for the apple industry and in aiding growers in selecting varieties for their orchards.

A cooperative preliminary report, entitled "A Statistical Study of Apple Shipments from Western New York," was published by Cornell University. This report presents information on domestic and foreign distribution of apples grown in western New York by variety, grade, size, and type of container.

A project on orchard management, conducted in cooperation with the States of Virginia, West Virginia, and Pennsylvania, is in its third and final year. Technical Bulletin No. 234, entitled "Marketing Apples Grown in the Cumberland-Shenandoah Region of Pennsylvania, Virginia, and West Virginia," was prepared in cooperation with the State experiment stations of those States.

THE EASTERN GRAPE SITUATION

An economic study of the eastern grape situation was continued in cooperation with the agricultural experiment stations of Arkansas, New York, Michigan, and Pennsylvania. A bulletin, entitled "Growing and Marketing Grapes in Erie County, Pa.," was published in cooperation with the Pennsylvania State College of Agriculture. This publication points out that lake-plain vineyards had fewer missing vines per acre and produced better yields than did the vineyards on the hill farms; also that, as a rule, when the yield was below the average there was little left as wages for the farmer after all expenses were paid. On the small farms it was cheaper to do the work with horses; on the average farm of over 50 crop acres it paid to use a tractor. Forty-six per cent of the grapes were transported from the farm by truck, and truck shipments realized

the highest prices. These small farms contain, on the average, about 50 crop acres, and of this acreage almost one-half was in grapes. The investment per acre is relatively large, and, as pointed out in the bulletin, efficient methods of production are much to be desired in times like the present, when grape prices are low.

RETURNS TO STRAWBERRY GROWERS

A study of the commercial strawberry industry of 11 Southern and Eastern States was continued in cooperation with their agricultural colleges and experiment stations. A manuscript dealing with production practices, costs, returns, marketing, distribution, and prices was prepared for publication as a technical bulletin.

The report shows that the strawberry acreage in the early-shipping States has increased greatly during the past decade and points out that further increases in these States are to be expected. Although early States have relatively high production and marketing costs as compared to other producing States, prices have been relatively well maintained in the face of increased production. The increased production of the early States has adversely affected the demand for strawberries from the second-early and intermediate States. However, with the possibility of a continuation of marketing costs at present levels and with lower wages and increased labor supplies, a considerable increase in the late-marketing States of the eastern group is to be expected. The results indicate that the important second-early and intermediate States have similar costs of production and that it would be advantageous to growers in different States to adapt their production programs to the demands of certain markets.

THE PECAN INDUSTRY

A cooperative study of the economic aspects of the pecan industry was completed, and a manuscript prepared for publication giving a detailed analysis of both present production and probable future production, of marketing practices and problems, and of production costs and returns.

Particular attention was given to determining the reasons for success or failure in the development and management of pecan orchards. This phase of the study shows that many pecan growers have not obtained profitable returns for the outlay of capital, labor, and use of land required by the enterprise, while others have had consistently good returns over a period of several years. Several factors are responsible, either singly or in combination, for the unprofitable returns from many pecan orchards. Planting unsuitable varieties and locating the orchards in soil which can not meet, or be made to meet economically, the plant-food requirements of pecan trees has resulted in many unprofitable orchards. Other factors which have contributed to low returns are planting pecan trees at intervals so close that the growth of the individual trees did not result in a normal, well-developed orchard, neglecting to control insect pests and fungous disease, and failing to follow well-planned systems of cultivation and soil upbuilding. The profitable yields obtained on the better managed orchards are proof of the possibilities of a well-planned system of pecan-orchard management.

BROOMCORN PRODUCTION

An economic and agronomic study of the broomcorn industry, carried on in cooperation with the Bureau of Plant Industry and the experiment stations of the States of Illinois and Kansas, was completed. A farmers' bulletin dealing with the production and handling of broomcorn was published, and another manuscript giving a detailed analysis of the results of the study was prepared for publication as a technical bulletin. These manuscripts show methods and costs of producing and handling broomcorn, give suggestions for improving methods, and set forth the economic place of broomcorn and the major competing cash crop in each of the important districts, as determined by natural conditions and different price relationships.

EARLY-POTATO FARMING IN VIRGINIA

The field work of a three years' study in the early-potato-producing sections of eastern Virginia was completed in cooperation with the Virginia Polytechnic Institute and the Division of Agricultural Finance of this bureau. This study aimed to provide a basis upon which early-potato producers may organize their farms for the most economical production and maximum net returns, and to determine the farmers' need for credit and the degree to which it is being met.

The very low price received for the 1928 early-potato crop of the area focused attention upon an old and permanent problem of adjustment. Thus far the farm-management phase of the study indicates that the general problem of the area is largely one of adjusting production to demand and of efficiency in potato production. A liberal expansion in producing food products for home consumption and feed for livestock would be in the right direction, one year with another. Although individual farmers may have limited opportunity for commercial expansion in production of truck crops, poultry, hogs, and dairy, there does not seem to be opportunity for the expansion of such enterprises to any large extent.

COTTON, PEANUT, AND HOG FARMING IN GEORGIA AND ALABAMA

An analysis of the farming problem in the peanut area of southeastern Alabama and southwestern Georgia was completed in cooperation with the agricultural experiment stations of Georgia and Alabama.

In this analysis the plow unit was taken as a measure of the size of the farm, since the usual cropper farmer operates one of these units. It was shown that the income from a single plow is insufficient to maintain a desirable standard of living. A 1-plow farm owner-operator may be in somewhat better circumstances than the cropper, since he may diversify his production to a greater extent and also farm more intensively. The relationship of the size of farm to the various enterprises of the farm organization was shown from the standpoint of production, income, expenses, and net results.

In general it was shown that production of hogs in the area is not systematic. Very little control is exercised over breeding operations; therefore pigs are being farrowed almost steadily throughout

the year without proper regard for the time of marketing, seasonal prices, or feed supplies. Effort will be made to furnish to the producers information on the general situation of the hog industry which will give them a basis for appraising the short-time outlook for hog prices and assist them in determining whether to market hogs early or late in the season. In this connection many hogs were found to be very light in weight at the end of the peanut-grazing season because an insufficient acreage of peanuts was reserved for their fattening. Standards were presented that will enable a grower to estimate more accurately the acreage needed to fatten a given number of hogs.

INFLUENCE OF WINTER LEGUMES ON CROP PRODUCTION

In cooperation with the Bureau of Plant Industry, a study of the use of winter legumes in farming systems of North Carolina, South Carolina, Georgia, and Alabama was continued. The data obtained show that the practice of plowing under winter legumes as fertilizers for cotton, corn, and other crops is, on the average, profitable. On the farms studied the yield of corn was increased from an average of 20 bushels per acre to 34 bushels by this practice, and that of cotton from 281 pounds of lint per acre to 381 pounds.

The net gain from the use of winter legumes as a fertilizer for corn was \$9.09 an acre, all costs considered, or \$11.76 an acre when only cash costs are considered, corn being valued at \$1 a bushel. Should the price of corn fall to 50 cents a bushel, the net gain would be \$2.09 per acre, all costs considered, or \$4.76 an acre with only cash costs considered. Relatively good net gains were obtained from the use of winter legumes turned under for cotton.

The critical factors in the profitable use of winter legumes are a good stand and growth of the legumes and a good stand of cotton, corn, etc., following the legumes. Information will be published which will be helpful to farmers in meeting these conditions.

ORGANIZATION AND MANAGEMENT OF COTTON FARMS

In cooperation with the Arkansas Agricultural Experiment Station, study was continued for the purpose of determining improvements in the organization and management of cotton plantations.

The agriculture of the piney woods farming area of Texas is representative of that in extensive areas in the Cotton Belt in which the natural conditions of climate, soils, and topography are fairly similar. Family farms predominate in the area, with cotton the leading, and in many cases the only, cash crop. A study was undertaken in cooperation with the Texas Agricultural Experiment Station to determine the commercial enterprises which could be profitably included in the farm organization to supplement the income from cotton and thus lessen the financial difficulties often caused by low cotton yields or prices.

EUROPEAN CORN BORER

A study to determine the most successful systems of farm organization and operation under corn-borer conditions is being continued in cooperation with the Indiana Agricultural Experiment Station

and the Michigan State College of Agriculture. In anticipation of the demands for information on changes in crop rotations, live-stock combinations, farm practices, and more effective equipment in existing farm organizations incident to the possible further westward movement of the European corn borer, a study has been inaugurated in the intensive corn-producing sections of northwestern Missouri.

An analysis of the possibilities of substituting other crops for corn in the Corn Belt indicates the definite impossibility of substituting cash crops for corn to any extent without seriously disturbing price relations and lowering farm incomes. Control measures can be added to the present farm operations at a cost that is small compared to the loss that may result if no control is attempted or if the growing of corn is discontinued. Although additional labor and expense are not needed until a serious infestation threatens, early consideration of a definite control program is advisable on each individual farm to avoid serious disturbances of the farm organization when the necessity for such a change arises.

SWEETCLOVER IN THE GREAT PLAINS

During the year an economic study of sweetclover on farms in the Great Plains area was undertaken in cooperation with the Bureau of Plant Industry. Records of utilization practices, cost of seeding, carrying capacity of sweetclover pasture, and increased yields of crops following sweetclover were obtained from farmers in nine States. Information will be published on the feed and fertilizer value of this crop.

ORGANIZATION AND MANAGEMENT OF WHEAT FARMS

Studies have been carried on in cooperation with the agricultural experiment stations in Kansas, Minnesota, Oklahoma, North Dakota, and South Dakota, covering various sections in these States, for the purpose of working out the most profitable combination of crops and livestock. Particular attention is being given to aiding farmers in establishing a more diversified system on lands which were formerly devoted entirely to wheat. Definite information is being gathered on the size of farm needed for profitable operation and the most economical types of power and equipment.

FARM-ORGANIZATION STUDIES IN KENTUCKY, VIRGINIA, AND TENNESSEE

A study involving the organization and operation of farms of greater than ordinary size was undertaken in connection with the agricultural experiment station of Kentucky. It is already evident that the analysis of the data gained in this study will be of major assistance in determining the conditions and the form of organization and operation under which such ventures are likely to be permanent and successful.

A project in the tobacco section of south-central Virginia looking toward the development of better systems of farming was continued in cooperation with the Virginia Polytechnic Institute. Largely because of the severe drought in 1930, the financial results on the farms surveyed in that year were much lower than during

preceding years, but they were encouraging when compared with those from other farms where changes in the farming systems have not been made during recent years.

In Tennessee the project relating to farm account books was continued in cooperation with the agricultural experiment station. During the year over 200 books were summarized and the results placed in the hands of farmers with interpretations of the outstanding reasons for success or failure in the year's operation.

TRUCK-CROP FARMING IN NEW JERSEY

During the past few years a number of farmers in the potato and truck crop areas of New Jersey have done practically all of their field work with tractors. In cooperation with the New Jersey Agricultural Experiment Station, detailed financial, feed, and labor records were started on approximately 40 motorized farms and 40 horse farms in order to determine the conditions under which each source of power may be used to best advantage.

LIVESTOCK FARMING IN OKLAHOMA

Mayes and Craig Counties, in northeast Oklahoma, are devoted mainly to the production of feed which is marketed or fed to livestock. In cooperation with the Oklahoma Agricultural Experiment Station, a project was started in these counties on the various systems of farming followed, with the object of determining the choice and combination of enterprises most profitable in view of the natural and economic conditions prevailing in the area.

RANGE-LIVESTOCK PRODUCTION

Studies of range cattle and sheep production and of ranch organization were continued in each of the important range-livestock-producing districts. These studies were carried on in cooperation with the Bureau of Animal Industry and with State agencies, and emphasized economical methods of production and ranch organization. Much of the information collected was placed before ranchmen in special meetings held for the purpose and in the form of printed reports. Publications were issued covering ranch management and organization in the Edwards plateau of Texas and in North Dakota and South Dakota. Work was continued in Montana and in the North Park and Saratoga Valley districts of Colorado and Wyoming. Special attention is being given to factors affecting range sheep and wool, and mohair production in Arizona and New Mexico.

ORGANIZATION AND MANAGEMENT OF DAIRY FARMS

A survey of 329 farms in 5 dairy areas in northern New Jersey was completed in cooperation with the New Jersey Agricultural Experiment Station. It was found that conditions under which it was more profitable to buy cows for dairy replacement than to raise them depend upon the contacts that have been established by dairymen and upon their skill as breeders.

Marked variations were found between farms and between areas in the quantities of concentrates used per 100 pounds of milk sold.

In one section, where many of the concentrates are home grown, 66 pounds of total concentrates were used per 100 pounds of milk, while in another section, where practically all of the concentrates are purchased, 43 pounds were used per 100 pounds of milk. Lack of balance in the rations was responsible for the waste of feed in the first area.

A manuscript is in preparation growing out of a 3-year study, made in cooperation with the Minnesota Agricultural Experiment Station, of the dairy region of northeastern Minnesota as represented by the group of farmers at Askov, in Pine County. It will discuss the elements involved in the organization and operation of small farms in the cut-over region, the practices of the local farmers, and the quantities of the cost elements used in production.

POULTRY FARMING

The study of the place of poultry in the organization of Utah farms was continued, and a bulletin was published by the Utah Agricultural Experiment Station setting forth various economic factors affecting the production and marketing of poultry products in Utah.

Plans were made for undertaking, in cooperation with State agencies, a study of the poultry industry which will be national in scope and will cover various economic phases of production, inter-regional competition, and movement and storage in relation to financial returns to poultrymen in various areas. It is proposed to utilize existing material wherever it is available and to make new surveys in areas for which such information is lacking.

SUMMARIES FROM FARM-BUSINESS STUDIES

Results from farm-business studies made by this bureau and by State agricultural experiment stations and colleges, covering 30,191 farm records from 336 localities in 25 States, were summarized and published in the 1931 Yearbook of Agriculture. This compilation shows for each farm the type of farming, average acreage, capital, expenses, and such forms of income as receipts, farm income, labor income, returns on capital, family living from the farm, and operator's earnings.

COST OF PRODUCING STAPLE CROPS

Cost-of-production figures for corn, wheat, oats, and cotton were published for the year 1930. Owing to the very low corn yields in 1930, the average cost of producing the 1930 corn crop on 3,616 farms was 89 cents per bushel, which was 16 cents higher than the cost in 1929. Corn yields reported by these farmers averaged 31 bushels per acre in 1929 and 23 bushels in 1930. Wheat yields in 1930 were generally reported as higher than in 1929, and the average 1930 cost reported by 2,334 farmers was \$1.09 per bushel, which was 15 cents per bushel lower than during the previous year. Wheat yields on these farms averaged 17 bushels in 1929 and 18 bushels in 1930. For oats the average 1930 cost reported by 2,526 farmers was 50 cents per bushel, which was 4 cents lower than the average cost reported in 1929. Oat yields reported by these farmers averaged 33 bushels per acre in 1929 and 34 bushels in 1930.

Cotton costs reported by 1,028 farmers were tabulated by yield groups, since many of the farmers reporting had yields that were much above the average. On 285 of these farms yields ranged from 101 to 180 pounds per acre and averaged 145 pounds. For this group the average cost was about 16 cents per pound. On the lower-yielding farms costs were higher, and on the higher-yielding farms costs were lower.

FARM RETURNS

Farm owners reported the financial results of farm operation in 1930, which was a difficult year for farmers because of drought and low prices. The averages of reports from 6,228 farmers show receipts from sales amounting to \$2,211, cash outlay for current operations amounting to \$1,452, leaving a cash balance of \$759; but a decrease of \$221 in inventory value of crops, livestock, and machinery and supplies was sustained, so that the net result thus defined was \$538. Other factors less completely or generally reported modify this figure.

The average value of food produced on the farm and used by the family was \$242. Interest paid on debts took \$199 (more on the farms paying interest) and on the average \$92 was spent for improvement of real estate. The value of the family labor not paid wages was estimated to be \$716 on the same basis as the \$378 paid to hired labor. Decrease in value of farm real estate amounted to \$757, or 6.3 per cent.

The average size of the farms for which results were summarized was 284 acres, worth at the beginning of the year \$12,009. The average value of personal property was \$3,156 per farm. These descriptions exceed census averages, partly because the farmers reporting are above the average of their localities, but more especially because few reports are received from farms smaller than 50 acres.

The average net result for 1930 of \$538 was only 41 per cent as large as the average (\$1,298) for the similar group of 11,805 farmers reporting for 1929. Receipts declined more than expenses, and reporting farmers were in poorer financial condition at the end of 1930 than they were at the beginning of the year.

CROP AND LIVESTOCK ESTIMATES

W. F. CALLANDER, in charge

DROUGHT SURVEYS

The severe drought which prevailed over a large portion of the country in 1930, causing widespread damage to crops, introduced many new and perplexing problems in crop estimating, and brought greatly increased demands for information on farm conditions during the drought period and subsequently. The bureau was able to respond to these demands because in the ordinary conduct of its crop-reporting work it maintains a close relationship with hundreds of thousands of farmers throughout the United States who are accustomed to furnishing information for their localities and for their own farms. When the drought situation first became acute, the Division of Crop and Livestock Estimates made an analysis of its current monthly information and called attention to the short corn crop and the resulting maldistribution of feed supplies for live-

stock. Food supplies for human beings, generally speaking, were found to be plentiful, but there was a serious corn shortage in areas where large quantities of home-produced and shipped-in livestock are fed. The regular crop report as of August 1 was published in much greater detail and was given much more widespread publicity than usual in order to disseminate the fullest possible information concerning the areas affected by the drought.

In order that the national drought committee and the State relief committees might have more detailed information with respect to the areas in which the situation might be expected to become critical, the first drought survey, as of August 20, was made. From the results of this inquiry it was possible to ascertain the supply of old-crop grain and hay on hand and the prospective production of the current year's crop in relation to livestock numbers on the same farms. These data provided a uniform standard for measuring the excess or deficiency of livestock feed.

When the American Railway Association made arrangements for a reduction in freight rates on livestock shipped out of deficient-feed areas and on feed shipped into these same areas, this bureau had available information which was of assistance in determining the counties in which these tariffs should be effective.

By November 1 it was apparent that additional facts regarding the rôle wheat would play as a substitute feed for corn and other feed grains were needed. A wheat survey was made, therefore, which disclosed that consumption of wheat for livestock feed would be more than double that of the preceding year. It disclosed also the parts of the country in which shifts in the feeding of wheat were more general and more pronounced.

CROP FORECASTS

Much progress was made in improving the basis of the monthly forecasts of crop production. In many instances the results of studies of the relationship of weather to yields were incorporated in the crop-forecast program. This was accomplished either by utilizing separately determined indications of yield from the weather reports as an additional indication to that obtained from the condition reports, or by utilizing a combined indication derived from a graphic multiple correlation of the two sources (weather and condition).

COTTON REPORTS

An extensive program of research in cotton estimating was drawn up early in the year and included the following: (1) Revision of yield and acreage estimates from 1919 to 1929; (2) retabulation of a number of reported items used as a basis for estimating acreage and yield, in which reports from the field and Washington lists were to be combined by districts; (3) the compilation of weather data, comprising a large number of the recorded items from selected stations; and (4) the preparation of numerous relationship studies using the retabulated reported items and weather data as indications of acreage and yield.

The tentative revisions of acreage and yield, which, by improving the comparability between years, increased the reliability of the

series as a basis for relationship studies, have been completed. Retabulation of selected items of reported data is practically completed. For a number of items this has resulted in marked improvement in the stability of State averages. The most essential items of weather data have been compiled, thereby practically completing that part of the program dealing with the preparation of basic material.

Using the revised data outlined above and supplemental material, over 500 relationship studies relating to acreage, yield, and production were prepared by this office during the past year. The acreage studies were designed to give a more definite and precise picture of the relationship between reported individual farm acreage changes and actual acreage changes in individual States. The studies of reported condition and probable weevil damage as related to final yields were refined. The use of relative advancement of ginnings on October 1, November 1, and December 1 as a statistical measure of the bias present in crop correspondents' estimates of probable yield per acre and probable county ginnings was inaugurated in 1930. This analysis should add to the precision of these indications of production. Other studies that were used related to the number of bolls per plant and to yields, sample data and bale weights, abandonment of acreage, fertilizer sales as related to acreage, indication of the percentage of the crop ginned to various dates, etc. These studies were used by the Crop Reporting Board as a basis of interpreting "raw" data into terms of acreage, probable yield, and production of cotton in the preparation of about 500 estimates incorporated in seven regular cotton releases.

Progress was made in perfecting studies of the effect of weather on cotton yields, three members of the field staff being called to Washington to assist in the studies. Satisfactory multiple relationships have been established in seven South Atlantic and Gulf States, and these studies will be used this season for the first time as indications of probable weevil activities and of probable yield per acre. Results to date have been very promising, and the studies will be continued with the objective of establishing similarly satisfactory relationships for all cotton-producing States. As a result of refinement of method, the cotton forecasts for the last few years have been remarkably close to the final ginnings, and their accuracy has been widely and favorably commented upon.

FRUIT, TRUCK, AND CANNING CROP REPORTS

The increased attention that the field force has been able to give to fruit, truck, and canning crops and the improvement made in the presentation of compiled material have made the reports on these crops much more useful. This is evidenced by the rapidly expanding demand for these data and the many letters of commendation received from the fruit and vegetable interests. Practically the entire series of reports already established on the various fruits and vegetables has been continued and new series of estimates on additional crops have been started whenever sufficient basic data could be assembled. In the past year, estimates were issued for the first time on Lima beans and beets, both for market and canning, on kale, peppermint, and horseradish. Information is now issued in the form of commodity reports, each containing all the currently

available estimates and notes on some one crop. The change from the former type of report has increased the usefulness of the statistics and permits limitation of mailing to persons who are certain to be interested.

The new series of reports on fruit and potato prospects has been well received. It has been found especially useful by growers' associations and by various fruit publications and other periodicals. One fruit publication has considered the material of such value to its readers that it has reprinted in full practically every monthly fruit-prospect report thus far issued.

A new method of tabulating and summarizing the reports furnished by canning establishments has been adopted and gives a more satisfactory running record of a canner's operations on each crop. The attempts to improve the reports have brought a gratifying response from canners. At least 60 per cent of the canning acreage of any crop is represented in the data on which estimates are based and frequently the proportion is much higher. Many calls have been made upon the statisticians in this unit to attend meetings of vegetable growers and canners to discuss the reports.

DAIRY REPORTS

The regular monthly statistical reports have been expanded to include milk estimates. While the work has not progressed far enough to permit the monthly milk production to be estimated currently in pounds, rapid progress has been made in determining the month-to-month changes in production and in measuring the factors responsible for these changes. A beginning has also been made in forecasting the probable trend of milk production several months ahead.

The dairy service is planned primarily to meet the needs of the 5,000,000 farmers who milk cows. It is founded on the belief that these men, if kept currently informed of the number of heifers being raised and of the plans of other producers in regard to increasing or decreasing their herds, will tend to so adjust their plans as to avoid both shortages of supply and troublesome surpluses, except in so far as these may result from weather conditions or changes in demand which can not be foreseen.

To obtain the necessary information on current production of milk and prospects for future production, the cooperation of about 15,000 dairy farmers has been secured. These dairy correspondents report on the first day of each month the numbers of milk cows on their individual farms, the number being milked, the pounds or gallons of milk obtained each day the quantity of grain being fed to milk cows, and the percentage of feed being obtained from pastures. They also report quarterly or semiannually the numbers of cows freshening each month, the numbers of heifers being raised, plans for increasing or decreasing the numbers of cows to be kept on their farms, utilization of the milk produced, the prices received for the dairy products sold, and much detailed information on special angles of the dairy problem. This information is supplemented by the monthly reports from more than 20,000 crop correspondents and by the similar records for about 130,000 farms collected twice a year by rural mail carriers.

All of the information obtained from all parts of the country is now being summarized in a new monthly publication entitled "Milk Production Trends," which is prepared primarily for distribution to the dairy farmers who cooperate with the department. A mimeographed statistical supplement to this report is issued monthly for the benefit of those who wish to have more detailed data for analysis.

CHICKEN AND EGG PRODUCTION REPORTS

A study on numbers of chickens and on production of chickens and eggs in the United States for each census year since 1879, based upon reports of the Bureau of the Census, has been completed and published. Other studies have dealt with consumption on farms, farm sales, shipments, with receipts and consumption at principal cities during recent years, and with much other original data relating to the poultry industry. Data received on the 1st of each month for 20,000 to 25,000 farm flocks belonging to crop reporters are being published monthly. While these sample flocks give an indication of the trend of numbers and production, special studies, and records for commercial flocks will be necessary for a true picture of trends in the poultry industry as a whole.

Reports on numbers of young chickens in farm flocks on the first days of April, May, June, July, and October have reflected the changes in the annual supply of poultry. Similar reports in October, December, and January, on numbers of pullets being saved for layers indicate the prospective supply of eggs. Consideration of these reports permits producers to modify their plans, if they desire, by marketing a greater or smaller proportion of these potential layers or by more or less drastic culling of hens.

LIVESTOCK REPORTS

Special effort has been made to obtain larger and more representative sample returns on livestock in the Western States. Reports from sheep producers in these States have been particularly good, the number of sheep tabulated for the January 1 estimates of numbers being over 10 per cent of the estimated number in these States. Most of the State offices now have very complete lists of sheepmen and have been able to classify these by size of flocks, which gives a much better basis for weighting returns when size of flock is an important factor in determining results.

The census data on all species of livestock on farms April 1, 1930, have been received and will be used as a basis for checking the present estimates of numbers on farms January 1. In order to get additional information on changes in livestock numbers between January 1 and April 1, an inquiry identical with the census schedule was sent in April, 1930, to a large number of farmers who had reported the number of livestock on their farms about January 1, 1930.

It is planned to have this work completed so that the livestock report for January 1, 1932, will show whatever revisions have been made in the estimates of January 1, 1930, and preceding years, as a result of the census for all species except, possibly, sheep. It is not anticipated, however, that these revisions will make any significant change in any of the present estimates for the United States or for the various regions.

FARM-PRICE REPORTS

The past year has been one of the most active in the history of the farm-price section. Prices of agricultural products declined throughout the entire period, and as this decline progressed public and private agencies showed a corresponding increase in their interest in farm prices.

In an effort to facilitate the handling of the many requests received, the work of preparing the price data of the past five years, by States, for publication in bulletin form has been started. It is intended to include in this publication monthly averages of farm prices by geographic divisions, the weighted crop-year averages of prices of farm products, and crop-reporting-district averages of the prices paid to producers for agricultural commodities produced in 1929. Averages of farm prices have been in great demand for outlook work, especially since adoption of the practice of conducting annual regional-outlook conferences. Crop-year averages for farm prices have been extensively utilized for a number of years in the computation of farm-income estimates. Crop-reporting-district averages of prices received by producers for agricultural products have been found of great value where reliable price data for units smaller than States are desired. This latter group of data was assembled in cooperation with the Bureau of the Census for the purpose of establishing county price estimates with which the 1930 enumerations of agricultural production could be evaluated.

A special inquiry on prices of forest products sold from farms in 1929 was also made by the Census Bureau with the assistance of this office. This inquiry was much more extensive than any other ever attempted on a subject of this nature, average prices received by producers for the 1929 cut of saw logs, veneer logs, poles, piling, pulpwood, firewood, railroad ties, mine ties, and fence posts being estimated by crop-reporting districts. These estimates were compiled on the basis of information obtained from the special price reporters of the bureau, from telephone, railroad, electric light and power companies, mine operators, and pulp and paper mills. Records of the Forest Service and the Interstate Commerce Commission proved of great help in checking the returns from these sources.

In addition to the projects mentioned above, the regular routine work of preparing and issuing monthly reports on prices paid to farmers for 45 commodities, quarterly reports on retail prices of 170 articles that farmers buy, monthly summaries of wholesale prices of miscellaneous products, quarterly reports on wages paid to hired farm labor, on the supply of farm labor and the demand for it, and the number of persons employed on farms, and, finally, the special news letter for United States price reporters was carried on as usual.

DIVISION OF COTTON MARKETING

A. W. PALMER, in charge

Because of the extremely low level of cotton prices, with the attendant distress among the 2,000,000 farm families dependent upon cotton production, all the facilities of the cotton division have been used in the general effort to help relieve the strained economic conditions. Work has been speeded up in all sections in order to meet

the increased demands for service and to furnish information needed in working out adjustments.

ENFORCEMENT OF THE UNITED STATES COTTON FUTURES ACT AND UNITED STATES COTTON STANDARDS ACT

The activities under these two acts were particularly heavy. There was a greatly increased demand for the services of the cotton classers of this bureau in classifying cotton delivered on futures contracts, and also a demand for licensed classers by growers who wished to have their cotton classed before its sale.

The fourth international conference met in Washington in May for the purpose of approving sets of the official cotton standards. This conference was attended by representatives from the cotton associations of Belgium, England, France, Germany, the Netherlands, Italy, and Spain, and by an unofficial observer from Japan, as well as by representatives from all the leading associations and exchanges of the United States.

CLASSIFICATION OF COTTON UNDER THE UNITED STATES COTTON FUTURES ACT

Section 5 of the cotton futures act requires that all cotton intended for delivery on futures contracts shall be classified by officers of the department. Boards of cotton examiners are located at New York, New Orleans, Norfolk, Charleston, Savannah, Houston, and Galveston, and an appeal board of review examiners at Washington, D. C. The cotton submitted for certification at Mobile, Ala., was classified by the board of cotton examiners at New Orleans, La.

The outstanding feature of the work this year has been the very large volume of classification and certification, which totaled 896,896 bales. The volume of work handled by the various boards of cotton examiners greatly exceeded that of any year, except the fiscal year 1930, since the passage of this statute. On March 13, 1931, the classification fee was lowered from 30 cents to 25 cents per bale.

CLASSIFICATION OF COTTON UNDER THE UNITED STATES COTTON STANDARDS ACT

Section 4 of the cotton standards act provides that any person who has custody of or a financial interest in any cotton may submit samples to the Department of Agriculture for classification. The various boards of cotton examiners of the bureau are authorized to perform this service in addition to the classification service under the cotton futures act. A total of 28,533 bales was classified under the cotton standards act.

In the last agricultural appropriation act an item of \$75,000 was included to provide additional facilities for supervising licensed classifiers under the cotton standards act. These funds will make it possible to add a number of experts to the staff and to provide a more thorough supervision of licensed classifiers than has been possible heretofore.

LICENSING OF COTTON CLASSIFIERS

During the year the licensing work has assumed greater importance than ever before, because the various cotton cooperative associations employed the services of licensed classifiers to a large extent. At the close of the fiscal year an increasing interest was still in evidence throughout the South.

A total of 327 applicants for licenses were examined and 248 licenses were issued. The importance of this work is shown by the fact that these licensed classifiers classed more than 2,700,000 bales of cotton under the supervision of this bureau.

COTTON MARKET NEWS AND QUOTATIONS SERVICE

The demand for market news service on cotton showed a further increase. Telegraphic reports were received each week from many domestic cotton centers, and weekly cable reports from other large cotton centers in France, Germany, England, and Italy. These reports contained information on the state of demand for various grades and staples of cotton, grade differences, quantities sought and in supply, basis prices, staple premiums, fixations, and other pertinent cotton-marketing information. These data were consolidated in a weekly review, which was telegraphed to field offices and representatives, to be mimeographed and mailed each Saturday to reach every part of the Cotton Belt by Monday morning.

In addition to the cotton market review there was prepared at each of the field offices a premium-staple cotton report which covered the prevailing premiums for cotton staples above $\frac{7}{8}$ of an inch, including the lengths from $1\frac{5}{8}$ to $1\frac{5}{16}$ inches. Certain material covering discounts at certain central markets was also issued in these reports.

Newspapers and periodicals continued especially active in publishing the information assembled, and their facilities for prompt and rapid dissemination were utilized wherever possible. Contact was made during the season with a number of additional rural news organs and resulted in increased dissemination. The circulation of the newspapers and periodicals that carried the cotton market news service reports is estimated to be about 6,500,000. Much of this information was also broadcast by radio stations.

SPOT-MARKET SUPERVISION

To insure that quotations in designated spot markets accurately reflected prices at which cotton is actually sold, visits to the designated spot markets were continued regularly each month, sales of actual cotton examined, and meetings held with the quotation committees of the respective exchanges. Under arrangement with the New Orleans Cotton Exchange, the official basis and difference quotations for that market were determined by the board of cotton examiners at that point.

During the year cotton prices reached lower levels than at any time since August, 1915, and very careful attention was directed to differences between grades for both the tenderable and untenderable cotton and to the quotations for the tenderable grades in the lengths $1\frac{1}{8}$ and 1 inch staple, which lengths command a premium over $\frac{7}{8}$ inch when delivered on futures contracts.

GRADE AND STAPLE ESTIMATES—CROP AND CARRY-OVER

The law directs the Secretary of Agriculture to publish an estimate of the grade, staple length, and tenderability of cotton carried over on August 1, and not less than three such estimates of the growing crop.

Owing to the fact that different qualities of cotton are put to different uses, it is important to both the trade and the producer that the number of bales of each quality produced be known. This is as fundamentally important as to know the total number of bales. The statistics collected under the act providing for the estimates of grade, staple, and tenderability of cotton make it possible to show what qualities of cotton remain on hand at the end of the cotton year, as well as how the quality of American cotton compares from year to year with previous crops.

In order to be of the greatest service to producers of cotton, reports on individual States and subdivisions of the States have been prepared. These detailed reports serve as a basis on which intelligent production programs can be based and are much in demand by cooperative and extension workers. The bureau has continued to furnish a detailed report to each cooperating ginner showing the number of bales of each grade and staple ginned at his gin. These reports serve as a basis for intelligent community planting.

GRADE AND STAPLE ESTIMATES OF CONSUMPTION

Grade and staple estimates of consumption furnish the producers with statistics which show the kinds of cotton which are most sought for by American spinners, and thus afford a guide as to what kinds of cotton should be grown to meet the American requirements and also to replace foreign cottons in North America. Since the United States textile industry is the largest individual consumer of American cotton, facts of this nature are especially valuable at this time when new textile fibers and improved processes of manufacture are being developed and when the spinning industry is endeavoring to find ways and means of cutting manufacturing costs.

The increased consumption of Indian cotton in the United States during the cotton year ended July 31, 1930, was caused by the combination of the low rate of exchange and the low price of cotton in that country. The increased amount of Indian cotton coming here seemed to be in competition with waste products rather than with straight American cotton. Ordinarily the greater part of Indian and Chinese cotton coming into this country goes into specialized use in the blanket and woolen industries.

COTTON UTILITY AND STANDARDS RESEARCH

In the many recent efforts to improve cotton-marketing methods and to solve cotton-marketing problems, much emphasis has been given to the importance of recognizing and rewarding quality.

In its efforts to perfect methods of determining quality in cotton fibers; to develop standards possessing the greatest possible accuracy, stability, and usefulness; to lay a foundation for better gin management and technic; and to contribute to the improvement of the quality of American-grown cotton the bureau is developing a program composed of three closely related lines of investigation, namely, fiber, ginning, and spinning studies.

FIBER STUDIES

The fiber studies embrace a scientific measurement of fiber characteristics and properties.

During the past year the laboratory has completed fiber-length arrays on the 1929 staple-length series, the 1926 series, and the 1918 series. Data from these tests are now being statistically analyzed as a basis for establishing the relationship between bales of a given staple length and of different staple lengths from which specifications for staple length may be drawn.

Supplementing these studies, investigations of the changes in the distribution of fiber lengths during the course of manufacturing processes are being made. The results of these investigations will serve as a basis for determining the accuracy of spinning as a medium of translating fiber lengths and for establishing a technological basis for staple standards.

The microanalytical studies during the past year, in cooperation with the Boyce Thompson Institute for Plant Research and with Clemson College, have brought results which indicate a definite relationship between the structural characteristics of the fibers and their reactions to humidity.

This work is of such a highly technical nature that no attempt will be made in this report to set forth the results obtained. These will be published from time to time in technical bulletins.

SPINNING STUDIES

In cooperation with the textile department, Clemson College, spinning studies have been made on a limited number of cottons grown under natural and irrigated conditions. Special effort has been made in the spinning work to develop technic and methods and to determine the full potential spinnability of cottons specially selected for extremes in certain fiber characteristics.

In cooperation with the Bureau of Plant Industry and a commercial mill, special spinning studies are being made with very long staple cottons in an effort to understand better the comparability of sea-island, Pima, Egyptian, and Sakellarides cottons.

GINNING STUDIES

Under act of April 19, 1930, Congress gave the Department of Agriculture authority to conduct investigations of cotton ginning. The Bureau of Public Roads was assigned the task of constructing, equipping, and operating the ginning plant, and this bureau was assigned the responsibility for laboratory analyses of the samples obtained during the investigations.

The ginning laboratory is located at Stoneville, Miss., and the two bureaus are enjoying full cooperation from the Mississippi Delta Experiment Station and from other agricultural agencies throughout the Southern States interested in this work.

COTTON DEMAND—TRENDS, CHANGES, AND CAUSES

Recent developments in the world cotton situation have emphasized the need for more information about the world demand for American cotton. This fact became apparent during the 1929-30 and 1930-31 cotton seasons, when cotton prices declined drastically, although production in this country was not unusually large. This decline in cotton prices may be attributed largely to a reduced

demand for American cotton in consonance with the general business depression and to competition from other growths of cotton and other textile fibers.

Compilation, interpretation, and dissemination of information on world demand for American cotton with respect to both quantity and quality are objectives of this project. Such information is in demand from cotton growers and those upon whom they depend for advice, being needed in planning the adjustment in production to meet world market conditions. This work is being carried on in cooperation with the Division of Foreign Agricultural Service of this bureau.

COTTON-PRICE STUDIES—RELATION OF PRICE TO QUALITY

Where the prices received by growers are the same for all qualities of cotton, farmers are more interested in high yields than in good quality, and they find it most profitable to grow the kind of cotton that can be produced at the lowest cost per pound, regardless of quality. As a basis for determining to what extent quality is reflected in the prices received by growers for cotton in local markets, the following work has been carried forward.

Data showing the grade, staple length, date of sale, and prices were collected for approximately 170,000 individual bale sales of cotton in 157 representative local markets during the season 1928-29, 130,000 individual bale sales in 124 local markets in 1929-30, and 90,000 individual bale sales in 136 local markets for 1930-31.

The results of the analysis of the data collected in 1928-29 showed that prices received by growers in local markets varied so irregularly that some farmers received considerably higher prices for the lower grades and shorter staples than other farmers received for the higher grades and longer staples in the same markets on the same days. These irregular variations are accounted for by differences in classification, differences in bargaining power of farmers, and other factors.

The average premiums received by growers for grades above Middling amounted to less than 50 per cent of those paid in central markets.

It has been pointed out that the proportion of the different grades and staple lengths of cotton produced in the United States can be brought more nearly in line with consumer demand and the net return to growers as a group can be increased (1) by perfecting the marketing system so that the prices received by growers will reflect accurately the differences in spinning utility of the different grades and staple lengths, and (2) by giving farmers accurate information on the relative profitableness of producing cotton of different grades and staple lengths in each locality.

ADAPTATION OF COTTON TO NEW AND EXTENDED USES

The decreased consumption of American cotton both at home and abroad, together with the low price, has given timeliness to the work on new uses and has confirmed the wisdom of according it a permanent place in the program of agricultural activities. The critical period through which the cotton industry is passing makes it imperative that work which will actually help to sustain the present con-

sumption of cotton be carried on, as well as researches into the properties of cotton and other fibers looking toward the discovery of basic information which will make for a greater consumption of American cotton.

During the past year a study of the cotton-picking sacks, cotton-picking sheets, and tarpaulins in use on the cotton farms of the United States, 1929, has been completed, and a report giving the results has been submitted for publication. This study shows that approximately 50,000 bales of cotton were estimated to be in use in the United States in 1929 in the form of cotton-picking sacks, cotton-picking sheets, and tarpaulins. It is estimated, further, that more than 33,000 additional bales of cotton would have been required had no burlap been used.

The duplex cotton fabric for consumer packaging of potatoes and onions, which was developed in cooperation with the North Carolina State College of Agriculture and Engineering, has been in use for some time. It is estimated that approximately 100,000 bales of raw cotton would be required to manufacture enough 10-pound cotton bags to move our average annual commercial crop of potatoes if these bags were generally used.

The prospects for the use of a cotton bag for packaging oranges look favorable. A representative of this division recently visited the leading citrus-fruit shippers of Florida and reports that they are very much interested in consumer packaging of oranges in cotton bags. This season 700 car-lot shipments of oranges packaged in consumer-size bags were shipped out of Florida. The shipments indicate that the bags are meeting with favor, and with a permanent freight rate on bags as a standard container for citrus fruit, next season should witness a decided trend toward the use of bags. Inquiries made of retail stores in Washington indicate that oranges packaged in bags are meeting with public approval and are highly indorsed by merchants.

An open-mesh fabric has been developed which is suitable for packaging pecans, walnuts, and other nuts. Samples of the fabric have been submitted to bag manufacturers, and from their comments it is believed that this bag will meet with satisfactory reception.

Effort is being made to develop a suitable and economical cotton fabric for patches on cotton bales. Cooperation has been given to the Bureau of Home Economics in developing cotton fabrics suitable for hooked rug foundations.

A study of the different types and sizes of containers used in the milling industry has been conducted during the past year. Data relative to the present use and the potential use of cotton in cotton bags for packaging flour, wheat offal, mixed feed, etc., are being compiled, and a report will be issued in the near future.

FRUIT AND VEGETABLE DIVISION

WELLS A. SHERMAN, in charge

MARKET NEWS SERVICE ON FRUITS AND VEGETABLES

The bureau's telegraph system, which includes approximately 10,500 miles of leased telegraph wires, continued to be used for the collection and dissemination of daily market information. Twenty-two permanent branch offices were maintained during the year and

40 temporary field stations for varying periods during the heavy movement of important crops. The telegraph service was extended to Fargo, N. Dak., where State officials cooperate in disseminating the information for the benefit of that section. Fifteen other States cooperate in a similar way in furnishing reports and in disseminating information taken from the bureau's telegraph wires, and nearly all of the temporary field stations are financed in part by the States in which they are located.

Daily mimeographed reports are still the backbone of the market news service, although broadcasting by radio and the use of the press have been extended year by year.

The demand for the mimeographed market reports as a basis for the settlement of railroad claims is very active. Many thousands of copies are furnished for this purpose alone. Numerous dealers and shippers maintain complete files of the daily reports for future reference.

A total of 15,252,500 mimeographed market reports were issued to a mailing list of 74,160, an increase of 1,705,500 reports over the record of last year. This division covers peanuts and honey in addition to fruits and vegetables.

CARLOAD-SHIPMENT INFORMATION

Fruit and vegetable shipments amounting to 1,053,019 cars were reported by the transportation lines. Daily shipment reports on 37 products were published by the bureau and complete market reports were issued on 27 of these. In addition, special reports on a number of fruits and vegetables on the Pacific coast and on citrus fruits in Florida were issued.

The shipment information furnished daily by approximately 460 division superintendents and other railroad officials includes the number of cars loaded in each reporter's territory and the name of the State in which the cars originated. These reports are supplemented by monthly summaries.

UNLOAD REPORTS FROM PRINCIPAL MARKETS

Car-lot unloads of all fresh fruits and vegetables have been obtained regularly in 29 cities in which the bureau has representatives. The carriers furnish similar information for 19 of the most important of these products at 37 additional terminal markets, making a total of 66 cities for which figures on the unloads of the principal commodities are available. These unloads are summarized in detail in monthly and annual reports, showing the distribution of the various products and the States of origin of the supplies at each market. Receipts by motor truck were also obtained in several cities, and are included in the unload summaries.

REVIEWS, SUMMARIES, AND SPECIAL REPORTS

Current tabulations of market prices and conditions for all the leading markets and shipping points have been maintained, and reviews, summaries, and special articles based largely on these statistics have been published.

A weekly market review of fruits and vegetables, which analyzes the market movement and prices of the week, has been issued. The

review is mailed out from the Washington office, and is sent also by telegraph to branch offices for duplication and circulation.

This report is given wide distribution by newspapers and journals on the bureau's mailing lists. Many other reviews and summaries are prepared and circulated with the aim of keeping producers and others informed on market conditions affecting the products in which they are interested.

INSPECTION SERVICE ON FRUITS AND VEGETABLES

The total number of inspections of fruits and vegetables, 371,648 cars, broke all previous records. Shipping-point inspection showed an increase of 68,676 cars and receiving-point inspection an increase of 15,103 cars over the previous year.

RECEIVING-POINT INSPECTION

A total of 59,843 carloads of fruits and vegetables were inspected at the 48 markets in which branch offices were maintained and at adjacent points. In addition, large quantities of food products were inspected for the purchasing departments of various Federal agencies.

The policies governing the use of the export form certificate which was issued on all unrestricted inspections of boxed apples and pears, which met the export requirements as determined by chemical analysis, were continued. The export form certificate was refused in all cases where arsenical spray residue exceeded the world tolerance of 0.01 grain per pound of fruit and where the fruit was not entirely free from apple maggot.

CERTIFICATIONS OF APPLES FOR EXPORT TO GREAT BRITAIN

The British embargo of 1930 prohibited the importation of low-grade American apples during the period July 7 to November 15. A special form of certificate was required, showing that each lot of apples met the requirements of one of the recognized grades. This certificate was issued only at the ports and could not be issued at shipping points or any interior market. It was not issued unless the packages were marked to show (1) the name and address of the packer, (2) the variety, (3) grade, and (4) minimum size.

SHIPPING-POINT INSPECTION

A total of 311,833 cars were inspected at shipping points, all but about 2,400 of these being inspected under cooperative agreement with State agencies. In addition, several thousand inspections were made of less-than-carload lots. Work was carried on cooperatively in all but three of the States. In addition, a cooperative agreement for the inspection of grapefruit and pineapples was entered into with a cooperative growers' association in Porto Rico.

INSPECTION OF CANNERY TOMATOES

For several years experimental work has been conducted in connection with the inspection and grading of cannery tomatoes. During the past year approximately 115,000 tons were inspected at factories in five States.

The service was extended to spinach in New York last season, 1,299 tons having been graded when delivered at the canning plants. This phase of inspection and grading work is steadily growing and will be extended to additional States and products next season. Ohio is planning to grade cannery cherries, and the cooperative service on cannery tomatoes will be given for the first time in Delaware, Maryland, and Utah, practically every canning plant in the latter State having signed up for inspection during the 1931 season.

RESEARCH AND STANDARDIZATION

During the year standards for 7 additional fruits and vegetables have been issued, and 13 sets of grades have been revised. Work leading to the establishment of standards for 12 additional products was begun. Canning factories are particularly interested in the establishment of standards for the various canning crops.

United States standards for 50 important fruits and vegetables have now been issued. As in some instances two or more standards are necessary for one commodity because of different types, use, or conditions in various producing-areas, a total of 67 sets of standards have been issued.

Studies of the handling and marketing of fruits and vegetables have been made. Mimeographed reports have been issued on the market demand for canned figs, shipping fruits and vegetables in mixed carloads, market preferences and practices involved in the distribution of potatoes, number of packages per carload, and a survey of the bulb industry. Manuscripts have been prepared for technical bulletins on marketing and distribution of fruits and vegetables by motor truck and on the pecan industry, and a statistical bulletin on car-lot shipments of fruits and vegetables.

Circular No. 149, Marketing the Commercial Crop of Early Potatoes, has been published. Unlike the late crop, the early crop of potatoes must be marketed promptly when harvested, and special care must be taken in its harvesting and handling to insure good condition on arrival at market. Since more than 60,000 cars of early potatoes are marketed annually, special attention has been given to outlining successful methods and practices. Information has been made available also on areas and volume of production, commercial varieties, prices, and market preferences in important consuming centers.

Various factors governing market preferences are of interest to fruit and vegetable producers and distributors. The study on market preferences and some practices involved in the distribution of potatoes in six eastern cities shows the trade preferences as to size, origin, pack, etc., of potatoes; reasons for price premiums and discounts; and related information.

Little economic information has been available heretofore in regard to the bulb industry. A mimeographed report, A Survey of the United States Bulb Industry, indicates districts of bulb production and kind and quantity produced. The results of a study of distribution and marketing practices are also included in the report, which should be helpful to producers and handlers of bulbs in developing their business along sound economic lines.

The motor truck has become a very important means of moving fruits and vegetables to market and is having a marked effect on

marketing conditions. A manuscript which has been prepared on Marketing and Distribution of Fruits and Vegetables by Motor Truck summarizes all statistical information on motor-truck movement of fruits and vegetables which is available in the bureau. Detailed surveys of the motor-truck movement in important areas were made and receipts in a number of cities were recorded. Judging from the sample studies, it seems probable that in 1929, 150,000 to 200,000 cars of fruits and vegetables moved to market by motor truck from beyond the market-garden area (a distance of 20 miles or more), compared with slightly more than 1,000,000 cars which moved by rail and boat. In addition to statistics on movement, various economic aspects of motor-truck transportation of fruits and vegetables are discussed in this manuscript.

Perhaps no information on fruits and vegetables published by the bureau in permanent form is more widely used by shippers, city dealers, and others interested in the industry than the bulletins showing the car-lot shipments from stations in the United States. This type of bulletin, which includes figures for two years in each issue, is issued periodically. The bulletin covering shipments for 1928 and 1929, which is in the hands of the printer, also includes information on shipping dates of various fruits and vegetables by States and a summary of available information on motor-truck shipments from certain areas.

Surveys have been carried on in cooperation with other divisions of this bureau and with outside agencies. There is a constant demand for information on the origin of shipments, market receipts, movement of products, comparative prices, etc., which this division aims to meet through the compilation and analysis of data gathered through the news and inspection services.

STANDARD CONTAINER ACTS

A total of 10,695 containers were tested by the bureau, an increase of approximately 70 per cent over the number tested last year. Approximately 40 per cent of the tests were of hampers, round-stave baskets, and splint baskets covered by the act of 1928, and 60 per cent were berry boxes, tills, and climax baskets covered by the act of 1916.

The act of 1928 requires manufacturers to submit specifications to the Department of Agriculture for approval.

The bureau continues to carry on educational work in order to bring about full compliance with the law. It was necessary, however, to report 12 cases to the Department of Justice for prosecution and several persons were found guilty of manufacturing, selling, or shipping illegal containers. Fines were assessed and nonstandard containers were ordered destroyed by the court.

PERISHABLE AGRICULTURAL COMMODITIES ACT

Although the perishable agricultural commodities act had been under discussion for several years prior to its enactment, its passage brought a flood of questions from all parts of the trade; questions which showed that, while the trade understood and approved the basic principles of the law, there was a lack of information on important details. For this reason it seemed important that the law should be

discussed and explained to the trade through a series of meetings in different sections of the country. These meetings were arranged by the trade organizations at various points throughout the United States.

A conference with representatives of trade organizations was held in Washington on July 17 for the purpose of securing trade views on proposed rules and regulations under the perishable agricultural commodities act. Following this conference, the proposed regulations were printed in the trade papers, and a conference with the trade in general was held in Chicago on August 11 and in New York on August 20. At both meetings there was free discussion of the act in general and the proposed regulations in particular. The regulations were promulgated on October 4, 1930, as Service and Regulatory Announcements No. 121. At the close of the fiscal year, 16,151 applications for licenses under this act had been received.

Complaints and requests for investigations began to be received by August, 1930, and continued at an average of 32 per week for the remainder of the year. Of the 1,527 cases received, 824 were investigated and closed and 703 were still pending at the close of the year. More than one-third of the cases concluded were closed as the result of amicable settlements being reached. Of the 703 cases pending at the close of the year, 102 had been sent to the solicitor of the department for legal action.

Of the 1,527 complaints received, 790 were for rejection without reasonable cause, 224 for failure to deliver without reasonable cause, 474 for failure to account correctly, and the remainder were on various other grounds.

PRODUCE AGENCY ACT

A total of 296 complaints were received under this act, 217 of which were closed and 79 still pending at the end of the year. Thirteen cases came to trial during the year, and every case resulted in a conviction. The work under this act is carried on in close cooperation with the perishable agricultural commodities act.

DIVISION OF LIVESTOCK, MEATS, AND WOOL

C. V. WHALIN, in charge

MARKET NEWS SERVICE ON LIVESTOCK, MEATS, AND WOOL

A market-reporting service covering daily price and market conditions for hogs moving direct from the farms in Iowa and Minnesota to packers was inaugurated. A field office which was opened at Des Moines covers 22 concentration yards and 7 large packing plants in Iowa and southern Minnesota.

Information on supplies, movement, demand, market conditions, prices, quality of marketings, producers' reactions to market conditions, etc., is received from the various Iowa-southern Minnesota buying stations and from organized sales agencies by telephone and telegraph each market day. It is immediately analyzed and made into composite reports that are suitable to the requirements of local newspapers, press associations, radio stations, leased-wire transmission, and releases to mailing list.

Inasmuch as Iowa produces nearly one-fourth of the commercial supply of hogs in the United States, and since approximately 60 per cent of its annual marketings move direct to slaughterhouses, the information obtained is highly valuable to producers and trade interests. This service has already become very popular in the area covered. Before the end of the year plans were made for inaugurating a similar type of service on sheep and cattle in the Intermountain States and California.

The news service was extended also to Nashville, Tenn., where a branch office is being operated in cooperation with the division of markets of the State of Tennessee. In addition to the regular mimeographed releases, daily market programs are prepared at this point for three radio stations.

At the end of the year branch offices were being maintained in 25 cities. Market conditions and prices on 24 public livestock markets, on 5 of the largest wholesale meat-market centers, and on the Boston wool market were reported. In addition, by continuing cooperative agreements with State and commercial agencies, widespread dissemination of the information was effected from 15 other points at which the bureau's leased telegraph-wire service was provided.

Plans were under way also for the extension of the service to Louisville, Ky., and Casper, Wyo., also for reporting the contract and direct sales of livestock in Montana, the intermountain, and west-coast regions, with headquarters for the intermountain area at Ogden, Utah. These extensions were provided for by Congress in the appropriation act for 1932.

EDUCATION AND DEMONSTRATION

Educational activities have been continued in cooperation with the Extension Service and the Federal Board for Vocational Education. Conferences of county agents and vocational agricultural teachers were attended in a number of States. At these conferences the Federal standards were explained and the value of the bureau's outlook material was shown. The same type of activity was also carried on at the request of many State or district livestock associations.

Requests for this work reflect the constantly growing producers' interest in marketing and economic information. During the year 36 assignments were filled in 16 States, and more than 19,000 persons attended the various meetings and demonstrations held.

In cooperation with the extension services of nine States, 93 livestock-grading demonstrations were held at ranches and farms. Members of this bureau attended National, State, and district livestock association conventions, where economic conditions, marketing problems, and the agricultural outlook were discussed, and many economic conferences were held with various interested groups.

Considerable attention was given to refining the plaster models illustrating the types and grades of slaughter hogs, which were developed during the previous year, and to working out methods of preparing these models from material which would resist breakage.

MEAT-GRADING SERVICE

The general meat-grading service is now available in 15 cities. Among the more important additions to those making use of the service during the year are the New York City hospitals, Girard College, and the Philadelphia penal institutions. Grading service on all meats has been continued for one large corporation in connection with the sale of precut and packaged meats which it inaugurated during the previous year. Increasing interest is being manifested in the service by stockmen, meat distributors, and large consuming organizations, such as hotels, clubs, dining-car service, and meat distributors.

Special service was rendered the national soldiers' homes through a careful check of meats, meat-food products, poultry, butter, eggs, and cheese delivered by contractors to the various homes. As a result of this service products below grade requirements were either rejected at the time of delivery or deductions were made on invoices.

BEEF GRADING AND STAMPING

The beef grading and stamping service, which provides for stamping beef with a roller stamp so that the grade appears on the retail cuts, has been continued. The total of 102,000,000 pounds of beef graded and stamped represents an increase of about 110 per cent over the previous year.

The demand for United States graded and stamped beef has come from many sources, particularly from national chain-store organizations, numerous local chains, and at least one voluntary chain with a membership of 189 independent retailers. Many independent carlot receivers at eastern markets are using the Government's beef grading and stamping service nearly every day, and hotel and restaurant supply houses in most large cities are constant users of the service.

Reports indicate that a large percentage of the better hotels and restaurants restrict their purchases of beef to that bearing the United States grade stamp, and some of the more prominent hotel chains have issued instructions to their units to limit purchases of beef to that bearing the "United States Choice Steer" stamp. The increased use of United States graded beef by the dining-car departments of practically all the large railroad systems has been a feature in the year's development.

LAMB-GRADING SERVICE

Grading and stamping lamb at Detroit, Buffalo, and Erie was new work undertaken during the year. It was begun in response to demands from local packers in the three cities, and the work is handled by the beef graders stationed at those points. The charge for this service is the same as for beef grading, namely, \$2 per hour for the grader's time. The demand for Government-graded lamb is increasing, and arrangements are being made to extend the lamb-grading service to other cities where beef-grading service is available.

THE STATISTICAL SECTION

Daily livestock prices are compiled and tabulated by 62 class weight and grade selections at 24 markets; daily fresh-meat prices by 45 class weight and grade selections at 5 markets; daily cured-

meat prices by 21 class weight and grade selections at 4 markets; weekly wool prices at Boston; weekly, monthly, and yearly averages of these prices; actual daily receipts of cattle, calves, hogs, sheep, and horses and mules at 18 markets; monthly gradings of meat by class; and many other types of information are handled.

In addition, a large volume of statistical work is carried on regularly at the leading market centers—Chicago, Kansas City, Omaha, and St. Paul—in connection with the market-reporting service. The work involves compiling records showing the State of origin of market receipts and the shipments of stocker and feeder cattle and sheep by class, grade, weight, and destination.

Reports are released weekly and monthly to a regular mailing list, giving a summary of the average prices of livestock, meats, and wool at the leading markets, compared with previous corresponding periods; the retail prices of meats; the receipts, stocker and feeder shipments; total shipments and slaughter of livestock weekly at 12 markets and monthly at all public stockyards; estimated monthly production and consumption of meats; and other market information.

GRADE STANDARDS FOR WOOL

During the year 271 sets of official wool and wool-top standards were distributed, 10 of which were issued to the Treasury Department for use at ports of entry and elsewhere as authority for grades of imported wool. Sets have now been sent to almost every important wool-producing or wool-consuming country in the world.

A series of studies has been inaugurated pertaining to the inter-relationship of diameter and length and structure of the wool fiber, as a foundation for further studies in spinning properties, behavior, working qualities, and utilization of the various types and grades of wool of the United States.

WOOL SCOURING AND SHRINKAGE INVESTIGATIONS

Grade analyses and scouring tests on wool samples were continued. As this work is done under standard conditions the reports of the tests forwarded to growers, wool pools, cooperative associations, and others are of value to them in determining the grade and shrinkage of the entire lot of wool they produce or handle. The tests made for experiment stations and special stock breeders are used in studying the effects of climatic conditions, feed, etc., on the grade and shrinkage of wool and in evaluating the results of wool-breeding experiments.

SLAUGHTER TESTS

Research in developing grade standards for livestock consisted of making a number of slaughter tests to determine the relationship of the grade of the live animal to the measurable physical and chemical characteristics of the carcass and the various wholesale cuts, and actually grading a large number of animals for the purpose of ascertaining the correlation between the grade of the live animal and the grade of the carcass obtained therefrom. Descriptions of tentative standards for six grades of slaughter sows were drafted as a result of these studies, and revisions were made in the tentative standards for the six grades of slaughter barrows and gilts.

Slaughter tests were conducted in cooperation with packers in Baltimore and Chicago. They showed definite relations between the tentative type and grade standards and the dressing yield and the percentage yield of cuts and leaf fat. Such cuts as bacon bellies, fatbacks, clear plates, jowls, and leaf fat decreased in percentage yield uniformly from the Prime to the Common grade, while hams, picnics, Boston butts, and loins showed an increase in the percentage yield as the grade was reduced.

Tests were conducted at the experimental abattoir at Beltsville, Md., in connection with the studies that have been in progress for several years as part of the investigations of quality and palatability of meat. These investigations are being carried on in cooperation with the Bureau of Animal Industry and Home Economics and various State experiment stations. The animals used in these tests were in most instances first graded as feeder animals, later as slaughter animals, and finally as dressed carcasses. A considerable number of these carcasses were then used in obtaining data on the yields and dimensions of various cuts and the relationship of such cuts to the carcass as a whole. The information obtained is expected to be especially helpful in refining the grade standard specifications and establishing them on a more definite and concrete basis.

HIDES AND SKINS

Considerable progress was made in the development of grade standards for hides and skins. A mimeographed publication, entitled "Tentative Market Classes and Grades of Kips and Calfskins," was prepared after many conferences with those interested in the hide and leather industries, and approximately 3,000 copies were distributed to tanners, hide dealers, and others.

Weight ranges recommended for the tentative market classes and grades of hides and skins are being used by the Bureau of Customs of the Treasury Department in connection with the allowance of repayment of duties on all leather exported which was made from foreign hides and skins.

SUPPLY, DISTRIBUTION, DEMAND, AND PRICE STUDIES

The work of analyzing and interpreting statistical material relating to livestock and meat supplies, market movements, demand conditions, prices, and distribution of animal products into consumptive channels was expanded. Producers, slaughterers, and meat distributors are now looking to the bureau for economic information for use in planning their production and marketing operations and in working out plans for necessary readjustments to meet new conditions.

The information developed through analytical studies serves as a basis for the semiannual livestock outlook reports. It is also used in preparing the numerous price and situation reports, radio talks, reviews, and addresses which are released or delivered at various intervals. Since the statistical-analysis work, to be of value, must have at hand reliable and comprehensive data relating to supplies, demand, movements, and prices, there is complete coordination and cooperation between the market news staff, the statistical and research sections, and other divisions throughout the bureau.

The annual statistical report on meat production, consumption, and foreign trade of the United States was prepared for general distribution to those interested in such information. There is an extensive demand for this report from research workers, statisticians, meat distributors, and others.

During the latter part of 1930, data on the slaughter operations of certain groups of large-scale slaughterers over a period of 10 years were assembled and summarized for use as evidence in the hearings before the District of Columbia Supreme Court in connection with the application of these slaughterers for modification of the packer consent decree.

RETAIL MEAT-PRICE STUDIES

A new project on compiling and analyzing retail prices of meats collected by the market news staff in New York and Chicago was started. The severe decline in livestock prices brought an urgent demand from livestock producers and others for more timely and comprehensive information regarding price trends in retail meat markets. Producers apparently were of the opinion that the consumption of meats was being retarded because retail prices were not being adjusted in line with the declines in livestock prices and that this was having a very adverse effect on the livestock situation. In order that producers and retailers might be kept fully informed on current prices and the actual readjustments being made, one specialist has devoted his entire time to a study of the retail meat-price structure and the yields of the various retail cuts, and has compiled composite retail prices which would permit comparison with prices in the wholesale market and in the livestock markets.

Retail prices collected in New York and Chicago were used for analysis and comparative purposes. These prices are obtained twice a month from a large number of stores of various types in both cities, and so far as facilities permit they are classified according to grade of meat sold and kind of service rendered, namely, credit and delivery or cash and carry. Composite prices, computed on the basis of grade and total carcass weight and value, are used for comparisons with wholesale carcass prices and livestock prices. Such comparisons show the actual readjustments being made and also the gross margins between prices paid for livestock and prices paid for meat at wholesale or retail. The information thus compiled is being made available to the public at regular intervals and is being used by the meat-trade periodicals.

DIRECT MARKETING OF HOGS

Research in the field of livestock-marketing methods was limited to studies of direct marketing of hogs. This method of marketing has attracted much attention because of the marked increase in the number of hogs being sold direct to slaughterers compared with the number sold on public livestock markets.

A comprehensive study of this subject was outlined and field work was begun in the spring of 1931. The phase of the problem which is receiving attention at present is that of comparisons of shrinkage in transit, dressing yield, and the relationship between live and dressed cost of hogs purchased direct and at public markets. Most

of the hogs bought direct are priced and settled for on the basis of weights at local shipping points or at concentration yards. Hogs purchased on public markets are never settled for on loading weights.

The general impression among packers is that hogs which were heavily filled on the farm have shrunk by the time they reach a public market, and although hogs are usually fed and watered upon arrival at a public market before being offered for sale, this fill is not likely to be excessive. Since the dressed yield of hogs is of vital importance in pricing the animals and since opinions differ as to what effect the different methods of handling hogs have upon this yield, this subject should receive intensive study.

Packers that buy hogs both direct and at public markets are furnishing data for this study. Plants killing hogs from the Middle West and located at public markets, at interior points near the source of supplies, and in Eastern States are included. The data for this study are obtained by individual lots, a lot being usually one or more decks of hogs. Comparisons will be made between hogs coming to these plants from various shipping points.

Data have been gathered on about 27,000 lots representing 4,500,000 hogs. Half of these will permit analysis of shrinkage, yield, and the relationship between live and dressed cost, while only shrinkage data are available for the other half. About nine additional plants will be included and will bring the aggregate total to about 40,000 lots, or approximately 7,000,000 hogs. It is expected that a preliminary report on the study can be released early in 1932.

GRAIN DIVISION

H. J. BESLEY, in charge

ENFORCEMENT OF THE GRAIN STANDARDS ACT

A new record was established during the year in the number of appeals handled by the several field offices. Appeals were carried to the department for final grading and certificating on 86,608 lots of grain which had been graded by inspectors licensed under the grain standards act. This is an increase of about 8 per cent over the preceding year. Of the total number of appeals handled, the Federal grain supervisor sustained the grade assigned by the licensed inspector in 71 per cent. The grade was raised in 10.1 per cent and lowered in 18.9 per cent of the cases. The inspection fees and charges on the appeals returned to the Federal Treasury were approximately \$117,300.

Complex administrative problems have presented themselves during the year because of the large surplus of wheat carried over from previous crop years and because of the activities of agencies operating under the agricultural marketing act. In this connection a survey of the quality and condition of the stocks of wheat held in storage in terminal markets and in country mills and elevators by the Grain Stabilization Corporation was made pursuant to a request made to the Secretary of Agriculture by the president of that corporation. This survey was made in the spring months by members of the board of review and district officers assigned to specified territories or areas. Approximately 87,000,000 bushels were examined, and a report was rendered to the president of the Grain Stabilization Cor-

poration. In addition, an examination was made of the stocks of wheat of the Grain Stabilization Corporation at Buffalo and at the Atlantic and Gulf ports for the purpose of informing the corporation of the approximate grades of its wheat in those locations.

Late in the fiscal year the Grain Stabilization Corporation engaged in a large movement of wheat from important primary points into terminal markets in order that the channels of trade might be kept open for the movement of the new crop of wheat. This movement has necessitated the reassignment of this bureau's force of supervisors, particularly in the Missouri River areas and farther southwest, for the purpose of handling the very large number of "out" appeals which the corporation called as a matter of general policy on all deliveries made to it.

The regular enforcement activities were conducted as usual. Seven cases of alleged fraud were investigated and closed, and several cases were pending at the close of the year. The field supervisors of this bureau act as agents of the Food and Drug Administration in preventing the adulteration of grain and the sale of products unfit for food. The chief form of adulteration encountered was the addition of water to dry oats and wheat and of screenings to corn. A general decrease in the use of screenings and musty, damaged wheat for mixing purposes has been noted. It is believed that objectionable practices can largely be eliminated by a wider diffusion of information on the kinds of material which the department considers unfit for use. Special attention has been given to the control of stocks stored for export.

EDUCATIONAL ACTIVITIES

The educational committee conducted educational campaigns and maintained contacts with producers, extension, and crop-improvement organizations throughout most of the grain-producing sections of the country. More than 1,000 country grain buyers and many leading producers attended grain-inspection demonstrations held in 11 grain-producing States. In four States railroad cars were equipped as grain-grading laboratories and moved from place to place.

This work was not only the means of instructing country grain buyers and producers in the application of the standards but also brought about close contacts between Federal grain supervisors, the extension services, and organizations representing producers and shipping-point buyers.

MILLING, BAKING, AND CHEMICAL LABORATORY

A study is being made for the purpose of obtaining information on what constitutes wheat quality. Extensive milling, baking, and chemical tests were made on 1,300 samples of wheat of different quality, grade, or condition for the purpose of noting differences in characteristics. Using the milling, baking, and chemical characteristics of country-run wheat as a standard of excellence a tentative scoring system was established. Comparative tests were made with terminal market-outturn wheat (milling as well as contract type) and export wheats from different areas. The same scoring system was applied. From the study it was possible to follow the variation in the milling

and baking quality of wheat as it moved from the country through the terminal markets and on into export channels. Furthermore, as the studies were made on a scoring basis, it was possible to state the degree of variation numerically.

A study of methods for estimating soundness in wheat was continued. It is apparent from the progress made that the problem is complicated and that it will be some time before definite conclusions can be announced. Approximately 3,500 tests were made this year in this study.

Research in the utility of electric moisture-testing devices of the rapid type has been continued. One device has proved satisfactory for hard wheats (spring, durum, and winter) and for corn. Studies are being made of the causes for unsatisfactory performance with the soft wheats, both red and white. The perfecting of the device for determining moisture in the other cereal grains was seriously hampered because of lack of material. Drought conditions dried the oats, barley, rye, etc., to such an extent that no range in test samples was available.

Many hundreds of milling, baking, and chemical tests have been made in connection with both the research and regulatory problems under the grain standards act and with the work of the Bureau of Plant Industry on cereal investigations.

RICE-GRADING SERVICE

The Federal-State rice-grading services conducted in Texas, Louisiana, and California were continued. A large part of the rice involved in foreign and domestic shipments is now graded under Federal supervision and sold on the basis of Federal-State grade certificates. The analyses as given on the grade certificate are used as a basis for establishing the value of rough rice to be sold. Most of the export trade uses the Federal rice grades when purchasing milled rice.

HARVESTING AND HANDLING OF RICE

A 3-year study of the use of the aspirator for cleaning rice at the stationary thresher was concluded. Investigations were conducted also in adapting the aspirator to the combine in harvesting rice.

A survey was made of the windrow method of harvesting rice and much valuable information was obtained. Studies were made also to determine the amount of shrinkage in weight sustained by rice as a result of the handling and drying operations at an elevator. The milling quality of various types of rough rice was studied at several rice mills.

Studies were completed on the artificial drying of rough rice and sorghum on the farm in a simple farm-built drier. The results showed that the storage qualities and marketability of the crops were improved and that the drying of the grain enabled the farmer to use the bulk method of handling and storing.

BULK HANDLING OF GRAIN AND RICE

Investigations into the economic advantages of handling grain and rice in bulk on the Pacific coast were continued in cooperation with the University of California. The results of several years' study were published in a circular entitled "Bulk and Sack Handling of

Grain in the Pacific Coast States." One result of the cost studies of bulk and grain handling was the adoption by a grain dealers' association in the Pacific Northwest of a number of changes in the schedule of discounts for grain handled in bulk. The basis of quotation was changed from sacked to bulk grain.

The best equipment for bulk handling of grain was also studied. Suggestions were made for a cheap and satisfactory bulk storage bin to be used on side hills and allowing the grain to be moved by gravity without the use of machinery. Investigations were made also on the effect of bulk handling on the grade and market value of barley. Certain phases of the bulk-handling problems have been studied by the Division of Farm Management.

DIVISION OF DAIRY AND POULTRY PRODUCTS

ROY C. POTTS, in charge

RESEARCH PROJECTS

Work was continued on a number of research projects in cooperation with other divisions of the bureau. Progress was made on studies of per capita consumption of milk and cream in cities in the United States and of consumption of dairy and poultry products on farms. The effect of changes in income and other factors upon the consumption of dairy and poultry products also is being studied. Data obtained from the various studies are being prepared for publication and have been used in preparing outlook reports and other releases of the bureau.

MARKET NEWS SERVICE

New reports covering the poultry industry were inaugurated as follows: Weekly egg market report; weekly poultry market report; monthly report of egg-breaking establishments; daily egg price report at Philadelphia; and daily price report on live and dressed poultry at Portland.

The first two reports are issued from the Chicago office to a mailing list of over 4,000. They summarize the important statistics on the commercial movement, supply, and prices of poultry and eggs, as well as trade conditions in the important terminal markets. These new reports have been received with interest by the trade and give promise of becoming valuable additions to the market news service.

The monthly report on operations of egg-breaking establishments shows the quantities of eggs broken monthly and the amounts of liquid whites, liquid yolks, and liquid mixed whites and yolks produced in the United States. An increase in the tariff on liquid and dried eggs has stimulated the operation of egg-breaking plants in the United States and has increased the demand for market information. More than 400 firms are on the mailing list for this report.

The monthly hatchery reports for 1931 were begun in January instead of in February as in previous years. These reports are distributed to a mailing list of nearly 4,000 firms and are widely published in poultry trade journals.

Daily reports were issued on car-lot shipments of dressed turkeys from Texas and Oklahoma passing through the railroad gateways

of Kansas City, St. Louis, and Chicago to eastern markets. Both shippers and terminal-market receivers were greatly interested in this information, and it is proposed to enlarge the scope of these reports to include all western car-lot shipments of turkeys moving to eastern markets.

The monthly report on market milk prices was enlarged by the addition of information showing the average daily purchases per producer by milk dealers for a large number of important areas. This new information was compiled at the request of the industry and it is obtained from a large number of milk dealers' and producers' associations who furnish data on the number of producers from whom milk is purchased and the total quantity of milk purchased. This makes it possible to calculate the average daily purchases per producer for each area or market.

The monthly condensed and evaporated milk market report was expanded also to show similar information regarding the average daily purchases of milk per producer by condenseries.

The monthly dry-milk market report was expanded to include information on the tone and trend of the casein market and the prevailing prices of casein.

At the Chicago office a new post-card report was inaugurated giving the prices on 92 and 90 score butter and 90-score centralized car lots, and the tone of the market and trading conditions. This report is issued primarily for the information of cream-station operators and is sent daily to a mailing list of over 7,000.

At a number of markets at which receipts of butter, cheese, eggs, and dressed poultry are compiled, arrangements were made to improve the reports by including more complete information on receipts by parcel post and truck. Parcel-post receipts of eggs at Boston are now included, as well as truck receipts of milk and cream. At New York receipts of poultry and eggs by motor truck are obtained, and it is planned to include motor-truck receipts of milk and cream. Cheese receipts at Chicago by motor truck are now included.

The quarterly report on production of manufactured dairy products has been superseded by a semiannual report which furnishes the same information by months and by States. This change has reduced the number of schedules sent to each firm, and it is believed that it will result in more complete information, thus affording a more accurate basis for the monthly estimates of butter and cheese production. Cooperation with the States in compiling this report was extended to include Wisconsin. This extension should result in obtaining more complete statistics on dairy products manufactured in that State.

The demand for market statistics has increased greatly. The number of persons on the regular mailing lists for reports has increased by nearly 25 per cent during the past year. Many special reports and summaries have been prepared also to meet the needs of particular groups or localities.

GRADING OF DAIRY AND POULTRY PRODUCTS

Several minor changes were made in the standards for dressed poultry, and the grade names were changed from United States Prime, United States Choice, United States Medium, and United States Common to United States Special, United States Prime,

United States Choice, and United States Commercial. No changes were made during the year in the standards for butter, cheese, or eggs.

There was an increase in the total number of grading or inspection certificates issued on all products, the principal increases being in the amount of butter and dressed poultry graded.

Previous to the past year no dressed poultry had been graded except at Washington, D. C. During the year this service was extended to San Francisco, Portland, and Seattle. It was undertaken also for groups of shippers at 34 shipping points in 7 mid-Western States. The grading is done by licensed graders under the supervision of this bureau. Each bird is labeled to indicate the proper United States grade and the grade tag is attached with a metal United States seal. During the fiscal year a total of over 2,000,000 pounds of dressed poultry was graded at shipping points, exclusive of dressed turkeys.

The grading of dressed turkeys was extended to shipping points in Texas. In order to train men in the grading of turkeys, a series of demonstrations was held at San Angelo, Tex., and was attended by more than 40 persons representing producers' organizations, buyers, and packers. Turkeys were also graded at shipping points in Colorado, Wyoming, Utah, Idaho, Nevada, California, Oregon, and Washington, in cooperation with State agencies.

DIVISION OF HAY, FEED, AND SEED

W. A. WHEELER, in charge

MARKET NEWS SERVICE

The organization of a national market news service on beans was the principal development of this project. Offices were opened at Lansing, Mich., for the pea-bean area and at Denver, Colo., for the sections producing Pinto and Great Northern beans. The established offices of the grain, hay, and feed market news service in California and at Chicago and Kansas City included beans in the service at those points. At the end of the year weekly reviews covering the market situation at the principal distributing points and in the main producing areas were being issued regularly from Washington and from the field offices. The States of California and Idaho have cooperated in the development of the service.

The grain and hay market news services were extended to the Intermountain States with the establishment of a field office at Denver. Comprehensive information is now being given to the grain and hay growers in Colorado, southern Idaho, and Utah. A special weekly summary of market conditions for grain, hay, and feed, applicable to the Southeastern States, is now being issued from the Atlanta office.

The news service on alfalfa hay begun during the previous year was extended and materially broadened. Statistical data required for the effective conduct of the service were compiled and utilized. The weekly reviews were in increasing demand in the Central States, the Southwest, and on the Pacific coast during the year.

Progress was made in developing a more comprehensive service on broomcorn. Methods of obtaining movement and stock figures

were improved and the data were closely correlated with those compiled by the Division of Crop and Livestock Estimates. Comprehensive weekly or monthly summaries of the broomcorn-market situation were issued from Kansas City throughout the year.

Additional contacts were made with the trade to broaden the scope of market information on rice, and the statistical data compiled in the project were improved and refined to make them of greater value to the trade agencies cooperating in their collection and compilation. The distribution of the weekly reviews was extended to California rice growers. The service is now available to growers throughout the southern rice belt and on the Pacific coast.

SEED-REPORTING SERVICE

Regular reports covering prices, supplies, movement, and other data for 42 kinds of field seeds were prepared and distributed. Seed surveys were made and situation reports issued for 25 seed crops. They were based largely on information obtained from about 9,700 country shippers and 30,000 growers, supplemented by data obtained from personal observations in seed-producing districts and from State agricultural statisticians. Foreign information was obtained through contact with foreign correspondents. Data from more than 12,000 retail dealers were assembled and reports were issued regarding prospective demand, retail sales, and prices. Special reports were issued on seed potatoes, cottonseed, vetch, and sunflower seed.

Demands for emergency and special work were heavier than usual. Members of the staff aided the American Red Cross in the purchase of seed, including over 600,000 packages of vegetable seed. A special survey was made of the sales of improved cottonseed for planting, and another was started on the purchase of seed used on golf courses.

SEED-VERIFICATION SERVICE

Approximately 36,700,000 pounds of alfalfa seed and 13,600,000 pounds of red-clover seed were verified as to origin, 65 seed dealers in 22 States having enrolled in the service. It is estimated that they handled 85 per cent or more of the alfalfa seed produced in the Central and Northern States and also a considerable portion of the red-clover seed produced in the United States.

HAY, STRAW, AND ALFALFA-MEAL STANDARDIZATION

The hay-standardization work the past year pertained largely to the study of color. A much improved colorimeter was designed early in the year and one was furnished to each of three field stations, namely, Los Angeles, Kansas City, and San Antonio, in order that the measuring of color might be facilitated at all of these important field stations. Conferences were held with the supervisors in order to compare their judgment of grades with the measurements made with the new machine.

There has been a demand for standards for straw for some time, particularly by the Army, since it is a large purchaser of straw. A large number of bales of straw were received from various sources, and analyses of chaff and color were made on these samples. The

color work on straw shows that there is a rather narrow hue range and that other factors besides hue may have to be taken into consideration in determining the grade of straw.

Progress was made in the research work on alfalfa meal and chopped alfalfa. A technological laboratory for use in the study of alfalfa meal and chopped alfalfa was designed, built, and equipped with up-to-date apparatus. The laboratory is divided into two parts, namely, a laboratory for microscopic and chemical studies and a mechanical laboratory for such studies as grinding, sieving, and aspirating. This new laboratory equipment should facilitate the progress in meal standardization.

CURING SOUTH TEXAS HAY

A study of south Texas hay, in which samples were taken at the time the hay was stored and again after having remained in storage from 9 to 12 months, showed that there is very little loss in color during the storage period. Hay dealers and others asserted that hay lost much of its color during the storage period, but this test would indicate that this idea is not correct. The average difference between the color of the samples at time of storing and at the end of the storage period was 5 per cent.

HAY CURING AND STACKING STUDIES AND THEIR RELATION TO QUALITY

A study of hay curing and stacking was begun in the Platte Valley in Nebraska with the agricultural experiment station of Nebraska. The results of the season's work seem to indicate that the principal cause for the stack spotted condition of the hay in the Platte Valley is either excessive moisture at the time the hay is stacked or penetration of rain and snow water during the fall and winter. Some farmers were stacking hay with as much as 40 per cent moisture at the time of stacking, which is considered excessive for safe storage. This project is of much interest in that section, because it is practically impossible to separate moldy hay from the sound hay when baling from the stacks, and all the hay which contains moldy and musty spots or flakes is graded as Sample grade.

HAY INSPECTION

Most of the mid-western markets showed a considerable decrease in the demand for inspections because of smaller receipts of hay at those markets. Other sections showed an increase which nearly offset this decrease. The business in California has continued to grow, several new inspection points being established there, so that Federal-State inspections are now being conducted at Los Angeles, San Francisco, and in five shipping sections. There was a large increase in the volume of business at Omaha, and also at Denver because of an arrangement by which the hay for the Denver stockyards is now inspected. The State-Federal inspection service in Oklahoma made the largest number of inspections that have ever been made in that State. A large amount of south Texas hay was inspected at Houston, Tex., for delivery principally to the Army. New inspectors were installed at Fort Worth, Tex., and in Wilson County, Kans., while the service was discontinued at Richmond, Va., and in Wisconsin, because of lack of demand.

BROOMCORN INSPECTION AND STANDARDIZATION

Standards for broomcorn issued tentatively by the bureau were discussed at several meetings of broom manufacturers held at Washington last winter in connection with the organization of the Broom Institute. Standards adopted for brooms to be made by this group were based on the revised standards for broomcorn after a few changes had been made. The standards thus revised were recommended as department standards effective March 1, 1931. Demonstrations of the broomcorn standards were held at Tucumcari, N. Mex., and were well attended.

BEAN STANDARDIZATION

In cooperation with the State department of agriculture of California a special survey was made of problems in producing and preparing beans for market under conditions prevailing in California. This study has resulted in slight changes in the grade requirements for California beans which became effective September 1, 1931.

A study based on data obtained in connection with the inspection service indicates that the grades for beans produced outside of California reflect more accurately the commercial quality of the respective classes. No change in the grade requirements for these classes seems desirable.

The total number of inspections made of beans was 3,361, an increase of more than 30 per cent. Federal inspection was made available to shippers in Michigan by the opening of a branch office in Lansing.

SOYBEAN INSPECTION

The number of inspections of soybeans during the year was 3,007, compared with 987 in 1930. This is accounted for by unusually heavy receipts at mills and by increased interest in the inspection at shipping points in North Carolina.

The expansion of the soybean-crushing industry made it necessary to extend the inspection service to Taylorville, Ill., and to Indianapolis and Lafayette, Ind. Upon request of the Federal Intermediate Credit Bank, of St. Louis, about 500,000 bushels of soybeans stored in elevators at Peoria, Bloomington, and Taylorville, Ill., were inspected for grade and condition. This work was done by local licensed inspectors under the supervision of this office.

DIVISION OF WAREHOUSING

H. S. YOHE, in charge

Continued progress was made in licensing warehouses under the United States warehouse act. The licensed capacity for cotton warehouses increased from 3,971,135 bales on June 30, 1930, to 4,830,339 bales on June 30, 1931; licensed capacity for grain increased from 54,064,618 bushels to 74,804,092 bushels; and for canned foods from 2,672,900 cases to 3,464,450 cases. The capacities for other products increased in somewhat smaller ratios.

These figures on capacity do not represent the volume of products that may be handled through licensed houses in a year. Some cotton warehouses may handle cotton amounting to two or three times their

licensed capacity each year, and it is not uncommon for a grain elevator to handle grain amounting to ten times its capacity in a year. From best available figures it appears that more than 50 per cent of the cotton crop is handled through federally licensed warehouses, while close to 400,000,000 bushels of grain pass through licensed grain facilities annually.

ADDITIONAL PRODUCTS PLACED ON ELIGIBLE LIST

During the past five years the department has been requested to place alfalfa seed on the eligible list for storage, under the warehouse act. After considerable study of the subject, regulations for the storage of seed were promulgated on November 21, 1930. These regulations defined seed as "Cleaned and hulled alfalfa seed, the identity of which is preserved while in storage." These regulations have since been amended to include uncleaned alfalfa seed and also bluegrass seed, both uncleaned and cleaned.

Amendments were made to the potato regulations to permit the storage of seed stock, as well as commercial or table stock.

CANNED-FOODS WORK

Work was continued on the preparation of standard grades for canned fruits and vegetables. Official grades for canned tomatoes, canned peas, and canned corn, both whole-grain and cream style, were promulgated. Further study was given to the tentative grades for canned beets, Lima beans, snap or green beans, spinach, sauerkraut, pumpkin, and succotash. A tentative draft of grades for canned grapefruit was submitted to the trade for criticism and suggestion. Preliminary studies have been made with a view to drafting standard grades for canned peaches, pears, apples and apple sauce, some of the smaller berries which are frequently canned, and for tomato pulp, catsup, and other tomato products.

A number of conferences were held with various committees of canners interested in uniform grades. To assist the various governmental agencies purchasing canned fruits and vegetables, conferences were held with the general provisions committee of the Master Specifications Board. As a result of these conferences, many of the ideas embodied in the department's standard grades have been incorporated in the specifications applicable to Government purchases to become effective July 1, 1931.

AMENDMENTS TO THE WAREHOUSE ACT

On March 2, 1931, a number of amendments were made to the warehouse act, the most important of which were:

. Authority to permit the Secretary to designate as his representative some one to perform a number of duties with which the act formerly charged the Secretary.

The elimination of that section which required a warehouseman to furnish bond to guarantee the performance of his duties under State law.

Authorizing the increase of fees for inspecting and licensing warehousemen and also authorizing the charging of fees for licenses issued to inspectors, samplers, weighers, and graders.

Amending the penalty section of the law to increase the scope of punishable offenses and to increase the imprisonment term from 1 to 10 years.

Conferring upon the Secretary exclusive jurisdiction over all licensees under the warehouse act so long as their licenses remain in effect.

Since the passage of these amendments the various regulations issued by the Secretary have been amended to meet the changes in the law, and the regulations for wool and grain warehousemen have been completely revised.

DIVISION OF STATISTICAL AND HISTORICAL RESEARCH

O. C. STINE, in charge

Continued effort has been made to present the facts concerning the world situation of the principal agricultural products. Much of this information is gathered by the various service divisions of the bureau, but it is necessary to assemble and analyze all of the factors having a bearing upon the prospects for each commodity. This work is basic to the outlook reports published by the bureau and aims to furnish the information needed in planning production to meet potential market requirements.

In addition to the annual outlook report issued in February of each year, special reports are issued from time to time covering specific commodities, a bulletin on the price situation is issued regularly, and information is prepared for the bureau's publications Crops and Markets, and Foreign Crops and Markets, and the Agricultural Situation. The continued severe business and agricultural depression has added greatly to the work of the division. There has been a steady demand for special information on particular commodities or conditions. Farmers are constantly shifting their production programs in the light of price changes. In making these shifts they have used the best sources of information they have had, namely, the prices they have been receiving. This, however, assumes that prices of one year are a satisfactory index to what the farmer can expect from his crop the following year. The bureau's outlook work is pointing out to farmers that they must consider economic conditions which are likely to prevail when their products are ready for the market. It has been noted that the country at large is taking a keen interest in the bureau's analyses of economic conditions, and it is believed that this work will help to bring about a more intelligent adjustment of the farm program in the light of the forecasts of future demands.

THE WORLD COTTON SITUATION

An outstanding contribution has been the publication of the World Cotton Situation. The small mimeographed edition of this bulletin was nearly exhausted at the meeting of cotton interests held at Atlanta last December, and 95,000 copies of the printed edition were distributed on request. In the distribution efforts were made to reach State workers, extension agents, vocational teachers, and leading bankers, business men, and newspapers. Together with the Outlook for Southern Agriculture, prepared at the Atlanta outlook meeting, this bulletin furnished the basis for many of the State reports as well as for newspaper articles on the situation. Supplementing the outlook reports, a mimeographed summary, entitled "World Cotton Prospects," is issued each month. This material is copied widely by newspapers and periodicals. An index of the prices of factors used in producing cotton has been prepared, and a great deal of time has been given to assembling figures on world demand for cotton.

WORLD WOOL PROSPECTS

A monthly summary carrying all the pertinent information on conditions in the wool markets of the world is published. It includes information on the demand and supply situation for wool in the principal wool-consuming countries, reports on prices in the primary markets, production, consumption, stocks, etc. The estimates of world production published by this bureau are accepted by many foreign as well as domestic publications.

A cooperative study was completed on world production and prices of merino and crossbred wool. This is the first thorough and comprehensive study of world production for the important producing countries covering a sufficient period to permit an adequate presentation of production cycles.

THE DAIRY INDUSTRY

The depression in the dairy industry has required further effort in furnishing adequate information about economic conditions in this field. A meeting of representatives of various sections of the dairy industry was held in St. Louis, Mo., in the spring of 1931 to consider the dairy situation. In cooperation with other divisions in the bureau a special mimeographed report, entitled "The Outlook for the Dairy Industry and Some Essentials of a National Dairy Program," was prepared to furnish the facts and forecasts needed by the conference. Since then this report has been revised and is now available in printed form.

The division has also cooperated with other divisions in the bureau in getting out a monthly report, called the "Dairy Situation," in order to furnish a brief statement of conditions and a summary of statistical information on the industry. World Dairy Prospects has been continued and gives special emphasis to developments in the foreign situation. A year ago a special report was published dealing with the competition from Canada that faces dairymen in the United States. This year a similar report has been issued showing the competition from New Zealand. The report on New Zealand is especially important because of the rapid development of dairying in that country and the fact that its surplus comes on to the world markets in our winter season.

It is recognized that a national dairy program requires a thorough understanding of demand conditions, and to meet this need special studies have been made of the factors influencing consumer demand in several areas. Milk-consumption surveys were made in Baltimore and metropolitan Boston in which about 5,000 records were obtained. Analyses of these records show that the use of milk tends to be affected by nationality, per capita income, and the number and age of children in the family. Absence of young children tends to lower a family's consumption of milk, since adults consider it children's food. The factors found to be most important in stimulating consumption are education and the knowledge of the value of milk in the diet.

POULTRY AND EGG PRICE STUDIES

The poultry and egg price studies are nearing completion. The cycles, mentioned in last year's report, have been revised slightly by an improved method of analysis and now include data for all of

1930. It was found that these price cycles are rather definitely related to the business cycle and to a production cycle. In the course of the analysis it was found that, for egg prices at least, deflation by the Wholesale Price of All Commodities Index is not an accurate method to use in eliminating the effect of price level.

WORLD WHEAT PROSPECTS

Each week a statement is prepared showing daily and weekly average prices of a number of principal grades of grains, together with the weighted average prices of all classes and grades of each of the grains at six important markets. These weekly statements are mailed to a small group of people who have specially requested them. Each month a statement is prepared showing weekly average and monthly average prices of grains at these markets. In addition to the weighted average prices, other price statistics and statistics of receipts and shipments, grain stocks, inspections, and similar data are compiled for various markets of the United States and certain foreign countries. A record of acreage and production estimates of grains of all the countries of the world is also kept.

A mimeographed bulletin, entitled "World Wheat Prospects," is issued monthly with occasional supplementary issues.

The annual Outlook Report includes statements on wheat, corn, oats, and barley based upon price analyses and statistical compilations. In addition to the annual outlook reports, there are in the case of wheat two regular supplementary reports, the Spring Outlook Report and the Fall Outlook Report, each of which is issued following the gathering of information concerning farmers' intentions to plant.

Of outstanding importance was the preparation last summer of a statement on wheat facts, which was later revised and printed as Miscellaneous Publication No. 95, *The World Wheat Outlook, 1930, and Facts that Farmers Should Consider*.

A report was completed on durum wheat, bringing together information on the course of production, consumption, and prices of durum in the United States and other important producing countries. This information should be helpful in estimating the probable future course of production in this country and competing countries, the demand for our durum both at home and in foreign markets, and prices to be realized for the crop.

RELATION BETWEEN WEATHER AND CROP YIELDS

Weather is universally recognized to have important effects on crop yields, and one of the projects of the division is to determine the relationships between weather and yields, so that weather reports can be used as a basis for estimating and forecasting crop production. Several aspects of the problem should be noted. In the first place, a knowledge of the influences of weather on yields is necessary if proper allowances are to be made for the uncontrollable elements in attempts to adjust production. Also weather-yield analyses furnish a valuable check on other information used in estimating production, and are one of the least costly types of information to be had for use in crop estimating. Next, it should

be noted that the full influence of given weather conditions may not become evident for a considerable period after they occur. A knowledge of their true influence, therefore, furnishes a basis for improving early forecasts of yields. In the case of precipitation it has been found that in parts of Canada fall rains influence soil moisture very greatly, and when they are inadequate the loss must be made up in the growing season or the crop will be damaged. The probabilities of their being offset by unusually heavy rains later can be calculated quite satisfactorily, so the study of precipitation and yields in such areas furnishes a very early forecast of probable yields. For other areas the supply of moisture is abundant and frequently excessive during the growing season, and for these areas it is necessary to recognize that a reduction of soil moisture one year is likely to show little or no effect on yields the next year. The need for such information in advising farmers on the outlook and in similar uses and the desirability of such analyses for the United States are obvious. But there are additional reasons for having such information for foreign countries. Foreign crop reports are characteristically unsatisfactory. In fact, some foreign countries do not even issue crop forecasts regularly, and some of the forecasts that are made are so unreliable that they can not be given serious consideration. Under these circumstances it is necessary for the United States Department of Agriculture to be ready to issue reliable information on the important foreign crops, and this can be accomplished best if the influence of weather on crop yields is understood.

In the last year additional attention has been given to the relation between weather conditions and crop yields, especially wheat. As these studies progress, bringing out the changing importance of various weather factors in determining yields with changes in geography, they tend to bring out more clearly the important factors and show where apparent correlation may be purely accidental. More complete weather data for Argentina, forwarded by the bureau's representative at Buenos Aires, are making possible more exhaustive studies for that country than have been possible previously. Further work recently done on relation of weather to wheat yields in western Canada is helping in attempting to evaluate probable Canadian wheat production under the unusual climatic conditions which have been prevailing this year. Progress is also being made on weather in relation to French wheat yields.

The division also cooperated with the Division of Crop and Livestock Estimates in studies of the relation of yields to weather conditions in the United States. From results to date it appears that sufficient study of this field could indicate to winter-wheat growers whether their yields are likely to be above average or below average before the wheat is planted, and by spring to give a reliable forecast of production.

THE LIVESTOCK INDUSTRY

The livestock industry was severely affected by the world-wide business depression, the drought, and the increased competition in foreign markets. At the beginning of the fiscal year livestock prices were declining at a rapid rate. Cattle prices began a downward trend in March, 1930, which continued almost without interruption until

the last of May, 1931, when prices were the lowest for that time of the year since 1911, and were 35 per cent under those for the same date in 1930.

The decline in hog prices was similar in magnitude to that in cattle prices. At the end of May they were also at the lowest levels in 20 years and were 40 per cent under those of a year earlier. Increased competition in foreign markets as a result of an expansion in hog production in the principal European hog-producing countries was an important element in the hog situation. Sheep prices were severely affected as a result not only of a reduced demand but also of a marked increase in production. At the end of May sheep prices were the lowest for that time of year since 1914.

These sharp declines in livestock prices, unprecedented except during the depression of 1920-21, necessitated considerable work during the year in analyzing the current situation as affected by the business depression, the drought, high temperature, and prevailing supplies, with the view of determining the most reliable indications of probable trends of production, market supplies, seasonal distribution of supplies, and prices. The abnormal conditions affecting the economics of the industries made it necessary, in addition to using the ordinary types of analysis, to study in detail the effects of other major business depressions, marked declines in the price level, periods of drought, and abnormal temperature on livestock production and prices. The results of these current studies were used in the preparation of outlook reports on hogs, cattle, and sheep and lambs, and in the preparation of a report entitled "The Reduced Feed Supply and Its Relation to the Livestock Outlook."

The monthly publication entitled "World Hog and Pork Prospects" was prepared and released about the 10th of each month. These reports contained an analysis of the most recent information on production, marketings, demand and prices of hogs and pork products in the United States and in all of the important hog-producing and pork-consuming countries.

POTATO PRICES

The work on potato prices consisted partly in preparing a manuscript for publication and partly in preparing three regional studies of potato prices and prospects for North Carolina, Maine, and Idaho. These studies of factors influencing potato prices and an analysis of the 1931 outlook in these regions were presented before farmers' meetings and published for wider distribution.

STATISTICAL RECORDS AND CALCULATIONS

One of the principal purposes of the division is to serve as a general source of statistical information on agriculture, and it gives attention to standards of accuracy in statistical research and statistical data. Because of these duties it is necessary for the division to keep up to date an ever-increasing number of statistical series and to assemble additional statistical information from time to time. The gradual growth in this work has been greatly emphasized by demands arising from the present depression.

TARIFF

The enactment of the 1930 tariff act has called for an increasing amount of attention to the tariff and agriculture. To meet the large number of requests on the changes of rates under the new act, a mimeographed bulletin was issued giving the tariff rates on agricultural products under the 1930 act as compared with those under the 1922 act. Prior to the enactment of the law the Members of Congress and others called upon the bureau for information indicating the extent to which various tariff rates might be effective on agricultural products and what responses American agriculture might make to various tariffs. For example, the division was called upon to prepare memoranda indicating the probable effect of a tariff on jute and the extent to which a tariff might be effective on long-staple cotton. Following the passage of the law, the bureau has been called upon to supply prices and import data and other information indicating whether the new rates that have been levied are effective. Such information has been asked for on practically all the important agricultural products of the country. Because of the detailed nature of the questions it has been found necessary for the division to study the influence of the tariff on each of the important agricultural products.

TRANSPORTATION

An increasing amount of work is being done on the relation of transportation facilities and costs to agriculture. Because of the importance of this work it has been necessary to follow in detail the investigations under the Hoch-Smith resolution and the rate cases before the Interstate Commerce Commission. A study was also made of the agricultural and transportation aspects of the milling-of-wheat-in-transit regulations for Kansas and Nebraska points.

Independent short and weak railroads receive special consideration in rate making. A study has been made of the extent to which this fact influences agriculture. It has been found that approximately 320,000 farmers are served by these lines, more nearly than by other roads. In these studies some attention has been given to the importance of this consideration to these short lines and their present financial and traffic problems.

The consolidation proposals of the Interstate Commerce Commission have been studied with respect to their influence on agriculture. For this purpose a series of maps has been prepared showing the consolidations proposed, thus indicating many effects which the formation of a system would have on the routing of and rates on farm commodities and suggesting the relative importance of the transportation economies involved. As an illustration of what this study shows, under current rules of rate making the inclusion of two now independent railroads in system No. 18 as proposed would wipe out the joint-line differential added to rates from Lamar, Okla., and reduce the charge on hogs to Oklahoma City by about \$9 per car.

Study is under way of the price comparisons for comparable grades of wheat in British and American markets in relation to transportation costs, since the theory rather generally stated that American

grain prices are made in Liverpool is recognized to be inadequate and in many cases misleading. To date this study indicates that a reduction of 4.2 cents per bushel in freight rates made by the Southwestern lines late in 1929 must be partly nominal during the summer months in its effect on prices. Studies of freight rates on western-bound livestock indicate a wide blanketing of rates from central-western Oregon as compared with a closer gradation with distances observable in rates from mountain-Pacific territory.

AGRICULTURAL HISTORY

As a basic work for members of the Department of Agriculture and students of agriculture generally, the division published a bibliography on the history of agriculture in the United States. It was assumed that this publication would be of interest only to technical workers, and therefore the edition of 5,000 copies was expected to supply requests for a period of 5 or 10 years. The demand for this publication has been so great, however, that the supply is practically exhausted seven months after its publication.

In addition to the general growth in the interest in agricultural history, the present depression has caused many to reexamine the developments in agriculture, both for the purpose of understanding our present situation and of discovering the responses that took place in agriculture following previous depressions. Adequate bibliographies greatly facilitate such work and lead to greater comprehension by students making such studies.

A mimeograph bulletin, *George Washington and Agriculture; A Brief Note and Classified List of Annotated References*, was published as a contribution to the bicentenary observance of Washington's birth to be held during 1932. Manuscripts have been prepared for bibliographies on American Indian agriculture and on the history of rice production in the United States. A bibliography is gradually being acquired on the history of agriculture in foreign countries, and these references are being made available to students through the current issues of *Agricultural History*. Articles and radio addresses were prepared on George Washington as a Farmer and Lincoln's Attitude Toward Farm Problems. As a part of the program of the Southeastern Economic Association at Atlanta, a member of the division presented a paper on *The Historical Background of the Present Situation in Southern Agriculture*.

DIVISION OF FOREIGN AGRICULTURAL SERVICE

ASHER HOBSON, in charge

Mr. Hobson resigned on August 31, 1931, to accept a position with the University of Wisconsin. L. A. Wheeler is now acting in charge of the division.

FOREIGN COMPETITION AND DEMAND

The foreign agricultural service is designed primarily to collect more accurate and more extended information upon world conditions regarding the production of, competition in, and market demand for agricultural commodities, with a view to furnishing a more reliable basis for production adjustments and marketing policies in the United States. To this end eight foreign field offices have been established. These are located at London, England; Berlin, Germany;

Marseille, France; Shanghai, China; Belgrade, Yugoslavia; Buenos Aires, Argentina; Pretoria, Union of South Africa; and Sydney, Australia, the latter four having been added during the last fiscal year. During the same period the number of commodity specialists was increased from one to eight.

Especial attention has been given by the Washington staff to the effective distribution of reports received from the field. The bureau's leased telegraph wires and market news service offices are being used to an increasing extent in disseminating current foreign news within the United States. This information is being coordinated with the periodic commodity reports issued by the bureau from Washington and the branch offices. Special arrangements have been made for the dissemination of crop and market information on fruits and nuts in the particular areas of the country producing these crops. By this means it has become possible to give increasingly prompt and efficient distribution to this important class of foreign information.

Other branches of the department, as well as the Department of Commerce and the Federal Farm Board, are supplied promptly with copies of the incoming cablegrams and reports in which they are interested. The content of the weekly publication *Foreign Crops and Markets* has been revised and its scope enlarged. Much information is received also by this office from offices of the Department of State, the Department of Commerce, and other Federal agencies. The number of commodities covered has been increased and emphasis is placed upon the prompt issuance of this publication.

LONDON OFFICE

The work of the London office in reporting current developments in the British market for American agricultural products has been continued and enlarged. Special cablegrams are being received on the London wool auctions and on the British consumption of wool which have an important bearing on the world wool-price level, and consequently upon the price of domestic wool in the United States. Regular cablegrams are furnished also on the British market for pork and pork products. Danish and colonial butter prices in the London market are cabled weekly.

In addition to the fruit specialist in the London office, the specialists on grain, wool, livestock, and meats, and one supervised by the Forest Service, giving attention to land utilization and forestry practices in European countries, have been added to the London staff.

The British apple import order, which prohibits the entrance of all but the higher grades of American apples during the period from July 1 to November 15 each year, gives added importance to the work of the fruit specialist attached to the London office. It has been necessary for him to make numerous inspections and certifications as to quality of American apples arriving in the British market. By means of these inspections it is possible to expedite the entry of large quantities of American apples.

Special reports were submitted by the fruit specialist on the effect of scald on export shipments and the means of preventing this condition, and also on the use of bushel baskets in apple exports. These reports were given immediate publicity in the apple-shipping dis-

tricts. This specialist continued the practice of writing individual letters to apple shippers in the United States, commenting on the condition of their fruit as he observed it on European markets. This service is much appreciated by apple shippers. Reports on market conditions for apples and pears were expanded and improved.

At the close of the fiscal year a new service was inaugurated to cover weekly market reports on the early deciduous fruit, such as plums, pears, and apples, shipped to European markets before the regular apple and pear season gets under way. This service was urgently requested by California fruit growers and shippers. Increased attention is being given to providing more comprehensive market reports on citrus fruit.

BERLIN OFFICE

The regular reports from the Berlin office on cotton, wheat, pork products, and fruit have been extended and improved. In these reports emphasis is placed upon the analyses of the demand for these products in the important consuming areas of northwestern Europe. The weekly cables of the Berlin office on Russian grain-crop developments and on European grain-market conditions are becoming recognized as a valuable source of information on these subjects.

The tobacco specialist attached to the Berlin office has submitted numerous reports on tobacco production in Europe and on the general demand conditions affecting the outlet for American tobacco on the Continent and in the United Kingdom. Special investigations have been conducted on the types of tobacco grown in Europe, and definite progress has been made on the classifications of European-grown tobacco in relation to their competitive significance to specific types of American tobacco. Other studies of the tobacco specialist have been directed toward the utilization of various types of tobacco in Europe and the trends and shifts in demand as between these types and American types.

BELGRADE OFFICE

The Belgrade office has developed a regular monthly report on wheat crop and market conditions in the Danubian countries. These countries constitute one of the important grain surplus producing areas of the world. Prospects for export from this region have a significant bearing on the world wheat-price situation. Special attention has been given to improvement of the statistical information on the supply of wheat, both production and stocks. With a sound foundation laid for grain-reporting activities, attention has now been turned to building up reports covering the production and marketing of other competitive products, such as fruit and pork.

MARSEILLE OFFICE

The Marseille office has made gratifying progress in the establishment of a comprehensive reporting service on the specialized fruit and nut crops of the Mediterranean Basin. Reports are being submitted monthly by mail and cable on almonds, walnuts, raisins, figs, and prunes. Preparations are under way for adding citrus fruits and olives to this list. Work is being done on the preparation of

reports along other lines, such as on wheat production and demand in the areas tributary to the office, on Mediterranean bean markets, and on general agrarian policy matters in southern European countries.

SHANGHAI OFFICE

The reporting work of the Shanghai office has been enlarged and extended. Reports are now submitted monthly on the demand for American cotton, wheat, and tobacco in the Orient. These include information on crop developments and results based to a considerable extent on personal observation. Definite statistical information on Chinese agricultural production is extremely limited. It is therefore especially important to have the best possible information of a general character on agricultural production in that country. The American consular officers, located in all parts of China and Japan, have rendered valuable assistance to the Shanghai office in giving a well-rounded picture of oriental crops and markets.

An outstanding accomplishment of the Shanghai office was the completion of a detailed report on regional agriculture in China. This report is based on extensive personal investigation and on the returns from questionnaires sent to missionaries throughout the agricultural regions. A summary of this report has been published and it is now being prepared for publication in its entirety.

PRETORIA OFFICE

During the few months of the fiscal year that the Pretoria office was in operation, basic reports were prepared and submitted on the wool, citrus-fruit, and tobacco industries of South Africa. In addition to the preparation of the special reports, a system of regular current reporting on fresh and dried deciduous fruits and citrus fruits has been developed. An example of these current reports is found in frequent cablegrams on the exports of fruit to Europe which serve to give advance information of significance to American exporters, who are also making shipments to the same markets.

BUENOS AIRES AND SYDNEY OFFICES

The offices at Buenos Aires and Sydney cover the most important agricultural areas of the Southern Hemisphere. Both of these offices have given especial attention to developing information on the acreage, production, and movement of wheat. The Argentine office has also covered flax. It is expected that during the next crop year more reliable information on wheat production and trade in the Southern Hemisphere will be made available. A start has been made toward the development of more timely and reliable information on wool and other products of interest to North American agriculture.

FOREIGN GOVERNMENT AGRICULTURAL POLICIES

Attention is being given to the collection and analysis of data concerning foreign government activities in behalf of agriculture. Because of the rapidly increasing number and variety of agrarian relief measures adopted within the last two years, the demand for information on this subject has grown to the point at which answer-

ing communications and preparing memoranda on current developments absorb a large part of the time of those in charge of this work.

The communications have dealt with such subjects as foreign tariff changes, countervailing duties, milling regulations, import-licensing systems, and various other types of import restriction; with export bounties and premiums, export monopolies, and other forms of regulation of exports; and with international agricultural conferences and agreements. Studies of these measures are carried beyond the mere assembling of the facts, into the realm of analysis and interpretation. The main activity of the section, in fact, is that of examining and appraising the effects of foreign governmental measures upon the interests of American agriculture.

A report has been prepared, for example, dealing with the significance to American farmers of recent Canadian tariff changes; another, with the proceedings of recent international wheat conferences. Manuscripts are approaching completion dealing with foreign government assistance to the raisin, currant, prune, and citrus industries.

A specialist on Russia has been added to the division's staff, in order that developments in this important competitive area may be followed more closely. In addition to following the current agricultural situation in Russia, special research is being conducted on the long-time aspects of Russian agriculture and their competitive significance to American agriculture.

DIVISION OF AGRICULTURAL FINANCE

ERIC ENGLUND, Assistant Chief of Bureau, in charge

AGRICULTURAL CREDIT

The credit work may be grouped under five subheads, as follows: Personal and Collateral Credit, Credit Corporations, Mortgage Credit, Emergency Credit Work, and Other Credit Studies and Activities.

PERSONAL AND COLLATERAL CREDIT

A project on current indices of deposits in country banks, as a measure of their ability to extend credit accommodations, has been continued. Through the cooperation of the Federal Reserve Board, data on country-bank deposits are now made available currently. One such index covers the deposits in 21 of the principal agricultural States, 1 covers the States of the Corn Belt only, 1 the States of the Cotton Belt, and 1 the Mountain States. These indices reveal clearly the relationship between credit supply in agricultural areas and the decline in agricultural commodity prices. This price decline, coupled last year with crop failure in certain States, reduced the flow of income into agricultural communities and lowered the level of bank deposits.

A comprehensive inquiry was undertaken which will provide information on the total volume of advances by banks to farmers in the United States. Similar information was published by the bureau for the years 1920 and 1923. The purpose of, security for, and risk on various classes of farm loans are also covered in this inquiry.

This and other studies now in process will be used to supplement information already on hand concerning credit conditions in the South and will make possible a more comprehensive presentation of these conditions and recommendations for their improvement.

An intensive study was made of the records of an Iowa country bank considered typical of a large group of successful banks in the Corn Belt area. Similar studies of other banks in this area will be made as rapidly as possible. Among the more significant results found may be mentioned the following: From 75 to 80 per cent of the bank's loans are made to farmers. The principal purposes of these loans are (1) to purchase livestock, (2) to pay for feed and other operating expenses, and (3) to pay existing mortgage indebtedness and to purchase real estate. These three purposes account for approximately 75 per cent of the loans.

Approximately one half of the new loans made are unsecured. The other half are secured by chattel mortgages and real-estate mortgages in the proportion of 5 to 2. Of the total loan operations each year, about 60 per cent represent new advances and 40 per cent are renewals of outstanding loans. The records indicate that the loans made for general expenses and feed are the most liquid. Naturally the real-estate loans are least liquid and cattle loans occupy an intermediate position in this respect. These records also indicate that renewals are decidedly less liquid than are new loans, these renewals representing more largely loans for the purchase of livestock and real estate. The loans outstanding at any time are relatively nonliquid, not more than 40 per cent being repaid within a period of 20 months.

The loan policy pursued by this bank, however, has proved highly successful and the bank is considered sound. Its deposits have remained stable and withdrawals have usually been coverable by cash reserve. The bank has seldom found it necessary to borrow from other banks.

The problems in financing the potato growers on the Eastern Shore of Virginia have been studied in cooperation with the Division of Farm Management. The results indicate that during the last three years growers bought approximately 85 per cent of their fertilizer for early potatoes "on time." Local dealers in turn purchased on time from 50 to 60 per cent of the fertilizer so used. Bank borrowings of the individual grower were relatively unimportant, the major reliance on credit in this area being represented by dealers' credit in the purchase of fertilizer.

CREDIT CORPORATIONS

Studies made of five agricultural credit corporations affiliated with cotton cooperatives showed that from the date of the first organization in 1924 until the close of 1930 these corporations had loaned \$41,000,000 to the members. Loans for 1930 were over \$8,000,000. Of 15 such corporations organized, however, only 6 are in active operation in 1931. The margin of earnings allowed the corporations in the past on their rediscounts with the Federal intermediate credit banks has in general been too small to cover expenses and absorb losses. The smallness of this margin of earnings has made itself

felt, particularly because of the very limited size of most of the loans, the relatively wide territorial distribution of these loans, the seasonal character of the business, and the heavy risk involved.

The studies of these corporations appear to indicate that the granting of production credit has no important bearing on the increase in membership of the marketing associations or the deliveries of cotton for marketing. At the present time, however, the credit corporations in many cases are rendering the members a much-needed service. The Division of Cooperative Marketing of the Federal Farm Board has cooperated in these studies.

Broader investigations carried on in connection with the more intensive study mentioned above show that agricultural credit corporations, including livestock loan companies, have increased rapidly in number during recent months. Whereas in August, 1930, the number of such corporations was only 245, the number in April, 1931, was 330. Many of the corporations in existence at the earlier of these dates have enlarged their capital with a view to expanding their services to the communities in which they operate.

MORTGAGE CREDIT

Efforts were continued to provide comprehensive current information on farm-mortgage conditions throughout the country. Periodical reports now received from mortgage bankers have proved of great assistance in this connection. These reports indicate that relatively short terms still predominate in the farm-mortgage loans made by institutions other than the Federal and joint-stock land banks, the average term being five years. These reports show also a tendency to restrict new loans to substantially smaller percentages of the value of farms than were permitted formerly, and requirements for annual installment payments have become more common. Supplementing the division's estimates of mortgage debt for 1928, other studies under way will give the basis for estimates of the amount and distribution of such debt for subsequent years.

Further attention was given to a study of the factors that have affected the marketability of Federal farm-loan securities, with particular attention to the problem of the earnings of the banks in the Federal farm loan system. The effects of the increased amount of real estate acquired and the depressed market values of joint-stock land-bank securities have been analyzed in relation to the salability of the bonds of the Federal land banks.

EMERGENCY CREDIT WORK

Much information on credit conditions was gathered in connection with the Federal drought-relief work. For most of the States in the officially designated drought region, separate indices of country bank deposits were prepared and supplied to those in charge of the relief work. One member of the staff acted as executive secretary to the National Advisory Loan Committee appointed by the Secretary of Agriculture to administer that part of the Federal drought relief available for capitalizing agricultural credit corporations. Detailed financial statements supplied by 44 new or existing agricultural credit corporations that applied for emergency credit were analyzed for the committee by another member of the division.

OTHER CREDIT STUDIES AND ACTIVITIES

The services of one member of the division have been loaned to the Federal Reserve Board for a part of the year to make a special study of the causes of bank failures and of other banking problems as related to agriculture. The large number of bank failures in farming districts during recent years makes such a study highly important.

At the request of the Pan American Union, cooperation was given to a committee appointed to consider the proposal for a Pan American agricultural credit bank. A report was prepared analyzing the economic problems involved in the proposal.

A study begun last year on the influence of central money-market changes upon the supply of agricultural credit for production purposes has been continued. A study on credit problems of Oklahoma cotton farmers was completed early in the year and the results published by the Oklahoma Agricultural College and Experiment Station.

Twelve articles on problems of agricultural credit and taxation have been prepared by the staff for the public press, and several radio talks on these subjects have been delivered. Two sections, covering farm-mortgage credit and farm taxation, were contributed to the Graphic Summary of American Agriculture published by the bureau.

AGRICULTURAL TAXATION

Four comprehensive research projects have been started in the field of agricultural taxation, as follows:

(1) The construction of a farm real-estate tax index, by States, for the years 1913 to 1930, inclusive.

(2) A study of the operation of the property tax in Louisiana in relation to agriculture. This study is being conducted in cooperation with the Louisiana Agricultural Experiment Station.

(3) A graphic presentation of some of the aspects of public finance in the southern Appalachian area. This is a part of a study undertaken by the Division of Land Economics.

(4) A study of the cost of local government in rural areas in Wisconsin in relation to farm taxation. This study is being conducted in cooperation with the Wisconsin Agricultural Experiment Station.

Special assistance was given to a subcommittee working under the advisory committee on social and economic research in agriculture of the Social Science Research Council in the preparation of reports on scope and method of research in farm taxation and in farm insurance. Six different research projects in credit were outlined by members of the staff for a credit subcommittee of the above-mentioned advisory committee.

AGRICULTURAL INSURANCE

A special study of fire losses on farms and means for reducing the number and amount of such losses was completed early in the year. The results were published as a joint contribution from this bureau, the Bureau of Chemistry and Soils, and the Bureau of Public Roads. This publication, entitled "Fire Safeguards for the Farm," deals in a nontechnical way with the threefold problem of (1) fire preven-

tion by safe construction, maintenance, and use; (2) individual fire protection by means of simple home equipment; and (3) rural group fire protection by means of community organization and motorized fire equipment. The bulletin has met with widespread demand, 41,000 copies being distributed before the end of the fiscal year.

Summaries of the business of farmers' mutual fire insurance companies indicate that these organizations are continuing to extend their operations and are insuring an increasing percentage of the farm property subject to loss by fire. The latest available comprehensive figures indicate that these companies, nearly 2,000 in number, now carry over \$11,000,000,000, of insurance, which is enough to cover to three-fourths of its value about 55 per cent of all the insurable farm property. Farmers' mutual insurance against the risks involved in the ownership and operation of automobiles has also made marked progress during recent years, particularly in the Middle West. Livestock insurance, according to information obtained, continues to decline in quantitative importance.

Plans for adapting hail insurance to meet more closely the farmer's real need for such protection were presented before an international association of State and municipal hail departments. Hail insurance continues to be the only form of crop insurance generally available to farmers. A new effort to provide a broader form of insurance on growing crops was, however, initiated in Kansas last spring. A summary of the various insurance needs of agriculture, the extent to which farmers now carry the different forms of insurance protection, and the existing facilities for such protection was prepared and presented before the annual conference of the American Institute of Cooperation.

DIVISION OF FARM POPULATION AND RURAL LIFE

C. J. GALPIN, in charge

The human factor in agriculture is becoming of greater importance. Various agencies, seeking to bring about a more balanced production of the major farm crops, work out plans for rationalizing acreage adjustments and then seek to present these plans to farmers in such a way as to obtain favorable action. As increased emphasis is placed upon planned production, the human factor in the situation will play a more important rôle. Nor is this confined to the individual farmer on his own farm. Local social control and the ideals of farm communities are being recognized by economists and by the public as facts and forces which must be taken into consideration in all agrarian policies. The problem is as much a sociological and psychological one as it is an economic one. The widely different work of those institutions, agencies, commissions, and private individuals who have sought information from the division concerning the human factor in agriculture gives ample evidence of the interest in the subject.

FARM POPULATION MOVEMENTS

Surveys of the movements of farm population have been continued. Each of the 10 years previous to 1930 showed a decrease in the total number of persons living on farms. It is likely, moreover, that this fact held good also for the previous 10 years, from 1920 back to 1910,

but data are not available on the subject. From 1920 to 1927 there was a decrease, year by year, of about 400,000 persons, while from 1927 to 1930 there was a yearly decrease of 200,000 persons.

The survey of farm population, made by the Bureau of Agricultural Economics, shows that the farm population during the year from January 1, 1930, to January 1, 1931, started to gain again, after losing ground for from 10 to 20 years. The bureau estimated that on January 1, 1931, the farm population was 27,430,000, as compared with 27,222,000 on January 1, 1930, a gain of 208,000.

The bureau's figures show that fewer persons left the farms for cities last year than in any year during the last 10 years. The number leaving the farms in 1922 was 2,000,000; in 1926, 2,155,000; in 1928, 1,923,000; in 1929, 1,876,000; but in 1930 it was 1,543,000. There has been a general though small decrease year by year in the number leaving the farms; but in 1930 there were 300,000 fewer persons leaving the farms than in the preceding year.

The movement of people from towns and cities back to farms last year was the largest in any year from 1924 to 1930. In 1924 it was 1,396,000. In 1930 it reached 1,392,000. Thus, while fewer people than usual left the farms to live in cities, at the same time more people went to the farms from cities.

COOPERATION WITH RURAL SOCIOLOGICAL EXTENSION PROGRAM

This division participated in a conference of extension rural sociologists called by the Extension Service. At this meeting a statement outlining the general objectives of extension work in this field and suggesting some specific lines of activity to be considered as part of an extension program was prepared. Permanent committees were appointed to study and report on needed research for an extension program and the assembling and adaptation of rural sociological material most helpful in an extension program.

FARMERS' ATTITUDE TOWARD ORGANIZATION

The study of membership problems of the Ohio Farm Bureau Federation and more or less related cooperative associations brought to light some highly significant facts. Among the leaders of the farm bureau was found a conception of what this organization is and what it has accomplished quite different from that existing among the rank and file of members and among other farmers who did not belong. Part of this discrepancy came from differences in emphasis of county farm bureau activity contrasted with more general and less easily seen activities of the State organization. Some of it was due to failure of farmers to keep themselves informed and some was due to the use of high-pressure salesmanship in the commercial activities of the organization. Local meetings were found to be the most successful and accurate means of spreading information, as well as an aid in the promotion of a wholesome, vitalized membership morale. Many other sociological findings of a highly practical nature came out of this study. In addition to the mimeographed reports already published, detailed reports for each of the 14 counties surveyed were prepared for the confidential use of the Ohio Farm Bureau Federation. State farm bureaus in several other

States have requested similar studies of their membership problems since the Ohio survey was made.

In April the division inaugurated another type of study in the Cotton Belt. This study proposes to find out the types of reasoning given by farmers in support of acreage shifts in cotton and other major cash crops; their behavior in response to price and other factors as indicated by changes in cotton acreages over the last six years; the extent to which these farmers receive and utilize or reject outlook information circulated by Federal and State agencies, and related problems. Answers are to be classified by tenure, experience as farm operator, schooling, average cotton acreage, extent of information on cotton markets, etc., to note any significant trends. The data are now in process of tabulation, and it is anticipated that a preliminary report will be ready by the next southern outlook conference in the fall of 1931.

The significance of this study lies in the importance being attached to rationalized control over production as proposed by the department's annual Outlook Reports and the evident need for further study of the human factor as a link of unknown potentiality in the chain connecting this outlook work with production activity on the individual farm.

DIVISION OF LAND ECONOMICS

L. C. GRAY, in charge

An unusually heavy demand has been made upon the Division of Land Economics for assistance and information on problems of land utilization and land valuation.

The division leader has taken part in many conferences, such as the convention of the chief appraisers of the Federal loan system, the meeting of the National Association of Real Estate Boards, and the International Conference of Agricultural Economists.

Addresses prepared on such subjects as the National Land Policy in Retrospect and Prospect, Responsibility of Overproduction for Agricultural Depression, Factors to be Considered in Forecasting Land Values, and others have been published in the proceedings of various economic associations. Much attention has been given to the preparation of information on specific phases of the national land policy, including analysis and recommendations for changes in pending bills submitted to the department for criticism.

LAND-SETTLEMENT STUDIES

Many inquiries concerning opportunities to purchase farms and farm lands and to establish various colonization and land-settlement plans in different parts of the country reach this office. As a basis for effectively handling such correspondence with prospective purchasers of land, land-selling agencies, and others interested in land settlement, a record of privately owned lands available for settlement is being kept, together with miscellaneous information concerning the practices of land-selling agencies.

A report entitled "Economic Aspects of Land Settlement in the Cut-over Regions of the Great Lakes States" has been published. This report is designed to supply information to persons contemplating settlement and to land-selling agencies and others interested in

the development of the region. A paper entitled "State Policies in Regulating Land-Settlement Activities" was prepared and read at the twenty-first annual meeting of the American Farm Economic Association, held in Cleveland, Ohio.

Work has been started on a study of land-settlement opportunities, problems, and policies in the United States for the purpose of helping land-selling agencies, public officials, and others to formulate sound policies with respect to land settlement and to help prospective farmers get acquainted with existing policies in the various States. Assistance has been given to officials of the Brazos Valley Water Users' Association and to a Georgia State committee on land-utilization projects.

LAND TENURE

The increasing importance of farm tenancy has led to an analysis of the subject on the basis of census statistics from the 1925 census in comparison with earlier censuses. Tenant-operated farms were 25.6 per cent of all farms in 1880 and 38.6 per cent in 1925. The value of all farm property, including real estate, used by tenants has not been reported at all periods, but it increased from 27.5 per cent in 1900 to 34.9 per cent in 1920.

The importance of tenancy is further emphasized by the fact that a large proportion of our staple crops is grown on tenant farms. In 1924 tenants produced 46 per cent of the corn, 38 per cent of the wheat, 67 per cent of the cotton, and 48 per cent of the tobacco. Since many tenants are less free to change their farming systems than are owners, the large proportion of tenants must be considered in all plans for better marketing and better adapted production.

The large increase of 74 per cent in the period from 1880 to 1925 in the number of tenant farms over 50 acres in size is significant, because in this group we find the most of our so-called family farms. Relatively the small tenant farms have increased much less rapidly. The tenant farms of 1,000 acres or more in size are mainly devoted to livestock production.

All this work is being kept up to date and used as a basis for planning and carrying out more detailed investigations concerning the problems of adjustment between landlords and tenants in areas where conditions are rapidly changing as to lines of production, technical methods, prices, and costs.

FARM LABOR

During the year a bulletin entitled "Perquisites and Wages of Hired Farm Laborers" was published. This gives extensive detailed data supplementing the department's periodical reports on farm wages by showing the variety, frequency, amounts, and values of the perquisites received by hired farm laborers, both casual and non-casual, in addition to money wages. It also makes a comparison of the average quantity and value of farm perquisites with the average city family purchases of similar commodities or services. Estimates made show that the total remuneration of noncasual hired farm labor equals or exceeds that of corresponding classes of labor in other specified occupations.

In June, 1931, a representative of this project was called upon in connection with the President's Conference on Home Building and

Home Ownership to serve on the committee on rural and village housing. The purpose of the work will be to assemble and study existing literature on the housing of special groups of rural population and to make recommendations for further research concerning housing problems affected by and affecting social and economic welfare of the special groups and their relationship to other elements of the population.

THE PUBLIC DOMAIN

Studies of the factors that affect the use of the public domain have been in progress in this division since it was established. A special study of conditions in Nevada has been completed and a manuscript covering the work has been prepared. At the request of a member of the Committee on the Conservation and Administration of the Public Domain, appointed over a year ago by President Hoover, copies of colored maps that picture relationships of legal tenure, range claims, existing and possible use, and control of all the lands of Nevada were made available to the commission in advance of publication.

These maps superimpose the land-tenure pattern upon the physical potentialities of the State. They show the distribution and uses of private and public lands as well as the complicated interdependence of lands having longer or shorter seasonal or otherwise restricted uses. One of them shows something of the complicated and competitive nature of claims now made by stockmen to grazing rights on public lands and the privately owned lands with which these public lands are necessarily associated.

Data for a similar study of the five northwestern counties of Colorado have been obtained, and this information is now being compiled and transferred to maps which will picture the physical, economic, and other conditions of the region. The region selected is one in which considerable agricultural development is possible and likely to occur in the not distant future as the result of improved railroad facilities due to the construction of the Moffat Tunnel.

LAND RESOURCES AND LAND UTILIZATION

The third revision of the Graphic Summary of American Agriculture, a compilation of 350 maps and graphs, with accompanying captions and text based mostly on the 1925 census of agriculture and on the annual estimates of crops and livestock made by the Bureau of Agricultural Economics, was published. Previous editions of this Graphic Summary have been widely used by all classes of agricultural workers, as well as by the general public. They have also provided from a fourth to a half of the illustrations in the various elementary and college textbooks on geography published since the World War, and the publication has been extensively used in departments of instruction in the agricultural colleges and in many State universities.

The soils section of the Atlas of American Agriculture was also prepared for publication. Part of the work in preparing the maps was done by geographers of this division, but the bulk of the work was carried on in the Bureau of Chemistry and Soils. This is much the largest section of the atlas to be issued. It summarizes the work of the Soil Survey during the past quarter of a century. With the

completion of the soils section the atlas will be ready for publication in a single volume. This atlas is the main source of information on the physical basis of American agriculture for agricultural experiment station workers, geographers, and other scientists.

Addresses were given and published on the long-time outlook for agriculture in relation to land utilization, population trends in relation to land utilization, and other phases of the land-utilization situation. In addition, work was started on the preparation of an article dealing with the social significance of land resources, to be used by the President's committee on recent social trends.

LOCAL LAND UTILIZATION AND REGIONAL PLANNING STUDIES

A study of land utilization in Knott County, Ky., was undertaken in cooperation with the Kentucky Agricultural Experiment Station, the Bureau of Home Economics, the Forest Service, and several divisions of this bureau. The manuscript for a publication entitled "Forestry in the Economic Life of Knott County, Ky.," is being reviewed for publication by the University of Kentucky. Three special reports, relating, respectively, to farm management, family living, and community organization, will be published.

A manuscript entitled "Land Utilization in Laurel County, Ky.," has been prepared for publication as a technical bulletin. The field work on which this manuscript was based was conducted in cooperation with the Kentucky Agricultural Experiment Station.

The study of land utilization in Nicholas and Webster Counties, W. Va., in cooperation with the Forest Service of the United States Department of Agriculture and with the West Virginia Agricultural Experiment Station, has been completed and a report submitted for publication. Recommendations are made for the classification of a part of the land as adapted to agriculture and another large part as being best suited to forestry. A small area is classified as being doubtful for agricultural use. It is believed that this general classification will be of service to extension workers and civic leaders in planning the agricultural and forestry program in similar counties.

The study, "Land Utilization and Farm Management in Wyoming County, Pa.," has been completed and the results have been published as a bulletin of the Pennsylvania Agricultural Experiment Station.

The results of a field study in Tioga County, Pa., will be published in two parts, one dealing with the farm-management aspects of the problem and the other with land utilization. These studies show that there are considerable areas in both counties that are distinctly nonagricultural and best used for forest and recreation purposes. The concentration of farming in the areas best suited for the purpose will eliminate wasted effort on the part of individual farmers and enable the political units to plan school and road-building programs on a sound basis.

Extensive preliminary planning has been done in preparation for an economic and social study of the southern Appalachians, in cooperation with the Forest Service, Bureau of Home Economics, the Department of the Interior, several State experiment stations, and other divisions of this bureau.

LAND APPRAISAL AND LAND VALUES

The fourth annual nation-wide survey of the farm real estate situation has been published. The investigation disclosed that, although land values generally continued the downward trend of the past several years, the average value per acre of farm real estate for the United States as a whole declined only one point in the bureau's index for the year ended March 1, 1930. This decrease may be compared with decreases of 1 per cent in 1929, 2 per cent in 1928, 5 per cent in 1927, and 3 per cent in 1926. For the Nation as a whole the average value of the farm real estate was 15 per cent above its pre-war average. At the peak of the boom in 1920 values were 70 per cent above pre-war.

Measured in dollars of the purchasing power of 1910-1914, values on March 1, 1930, were approximately 15 per cent below the pre-war levels. The average number of forced sales per thousand farms was 20.8 for the year ended March 15, 1930, a slight increase over the rate for the preceding year. The 1930 figure interrupted the downward trend in forced sales which had obtained from 1927 through 1929. The increase in forced sales was manifested both in number of farms sold for delinquent taxes and in those sold as a result of foreclosure on mortgages, bankruptcies, and other defaults. The report further stated that the demand for farms continued light, such purchases as actually occurred apparently being made by farmers buying for actual operation.

The fifth nation-wide survey is well under way. A preliminary report issued in May indicated that, as a result of the very unfavorable year, land values for the year ended March 1, 1931, had experienced the greatest declines since 1922, the average for the United States having dropped 8 per cent during the year, to a point only 6 per cent above the 1910-1914 average. On March 1, according to the report, land values in 15 States were below pre-war levels, and the indications were that the tax and foreclosure situation is not clearing. The experiment stations of several States have requested cooperation in making intensive studies of the value structure of the farm real-estate market in their respective States. Several States planning to hold land-valuation short courses have extended invitations to representatives of this division to give talks on land values or related subjects.

VALUATION OF LANDS IN THE MISSISSIPPI VALLEY

The work of appraising agricultural lands in the lower Mississippi Valley in connection with the flood-relief program of the War Department was continued during the past year in cooperation with other bureaus of the department. A report was submitted to the War Department, February 1, 1931, covering over 700,000 acres of agricultural land, which accounted for almost one-half the value of the real property covered in the appraisal. Further appraisal work is being carried on for the War Department in the Birds Point-New Madrid floodway in southeast Missouri. This involves the valuation of flowage rights on the lands which are to be subject to overflow in the operation of the floodway.

SMELTER-FUMES INVESTIGATIONS

A special study of the economic damage of smelter fumes in the valley of the Columbia River of northeastern Washington has been conducted at the request of the State Department on the basis of funds transferred from that department. It is being carried on in cooperation with the Bureau of Chemistry and Soils and the Bureau of Plant Industry. So far as is known, this is the first study made by economists on the effect of smelter fumes on farm-land values and the farm business as a whole. The preliminary report on this study is practically complete and indicates the great complexity of the nature of economic damage to agriculture and forestry by smelter fumes.

TOBACCO SECTION

CHARLES E. GAGE, in charge

The Tobacco Section has completed its second year and has made encouraging progress, notwithstanding the adverse conditions under which it has operated, resulting from unusually low prices paid to tobacco growers. The major project of this new unit of the Bureau of Agricultural Economics is the inspection and certification of grade on leaf tobacco by tobacco graders under Federal-State appointment. Inspection service was supplied at 96 auction warehouses and 27 cooperative association receiving stations during the year, compared with 22 auction warehouses and no cooperative receiving stations during the preceding fiscal year. In addition, a beginning has been made in the inspection and certification of tobacco for export trade.

The total amount of tobacco officially graded during the last fiscal year was 48,155,791 pounds, compared with 11,741,636 pounds graded during the preceding year. The Tobacco Section is now providing grading service for two cooperative associations of tobacco growers, one in South Carolina and one in Wisconsin.

A qualified tobacco expert has been employed to develop technical knowledge of the physical characteristics of leaf tobacco with particular reference to standard grades. It is expected, too, that this work will yield important results in accurately defining standard grades and making it possible to maintain them unchanged from year to year. The staff has been further increased by the appointment of a specialist in cigar tobacco, who supervises the grading activities on cigar types and studies the marketing problems of cigar-tobacco-producing districts.

The second major project of the Tobacco Section pertains to the quarterly reports of stocks of leaf tobacco in the hands of dealers and manufacturers. The handling of these reports has been reduced to a routine procedure. Contact is maintained with members of the tobacco trade and their cooperation obtained in maintaining the accuracy of the reports.

COLD-STORAGE STATISTICS

WILLIAM BROXTON, in charge

During the year the Cold Storage Section undertook the compilation of a monthly report on the manufacture of oleomargarine. The biennial survey of refrigerated warehouse space was issued, as well as a biennial bulletin on cold-storage holdings and refrigerated warehouse space. At the request of members of the cold-storage industry a list of all of the concerns reporting cold-storage holdings was prepared for publication. All of the periodic reports on the various commodities held in cold storage were continued as in the past.

ECONOMIC LIBRARY

MARY G. LACY, in charge

The services of the library were in greater demand than ever before. Reference work was heavy and varied. The topics upon which information was most often requested were wheat, the tariff, farm income, and wages. The work of preparing bibliographies covering the literature on the economics of production and marketing was continued. These bibliographies are in constant demand, and research workers state that they are invaluable to them.

The mailing list for the monthly publication *Agricultural Economics Literature* has grown steadily and, judging from the comments received from users, it appears to be meeting a need in keeping agricultural workers in touch with the latest additions to agricultural economic thought.

There was an increase of 13 per cent in the number of letters dictated in the library, although form letters were used wherever possible.

DIVISION OF ECONOMIC INFORMATION

J. CLYDE MARQUIS, in charge

The rapid expansion of the use of economic information by farmers is shown strikingly by the steady growth of demand for bureau publications. These continue to increase both in numbers and varieties. The bureau's work in research and service now covers many new subjects, each of which involves some type of a report. While requests were formerly for dozens of copies, the reports are now asked for by the hundred.

The expansion of Federal and State extension agencies in organizing and developing agricultural economic work has provided an outlet for all types of information. These workers need material as a background for current work and for training as well as for extension.

The teachers of vocational agriculture in rural high schools have been directed by the Federal Board for Vocational Education to include economic subjects. They have become particularly interested in the outlook work, and arrangements were made to send copies of all bureau publications bearing upon the agricultural outlook to the entire group of these teachers. The head of the Division of Economic Information appeared before State conferences of these teachers to explain the character and scope of the bureau's publications and to give suggestions regarding their use in teaching work.

NEW OUTLOOK PUBLICATIONS

To meet the need for comprehensive understanding of the situation with respect to certain major crops, several bulletins of a new type were issued during the year. These included the following: The World Wheat Outlook and Facts That Farmers Should Consider, Miscellaneous Publication 95; World Cotton Situation, Miscellaneous Publication 104; and The Outlook for the Dairy Industry, Miscellaneous Publication 124. Altogether these publications were printed in editions exceeding 325,000 copies. For the first time a popular edition of the Outlook Report was issued for the direct use of farmers; the edition was 225,000. A meeting to formulate the outlook for the Southern States was held in advance of the regular meeting, that the material might be available in time for southern plantings, and a separate report was printed for southern use. The edition was 105,000.

These publications represent the type of background discussions that are being prepared to cover most of the major crops and classes of livestock. They represent a summary of economic information not heretofore available. Text, statistics, and liberal use of charts make them useful as teaching aids.

Exhibits have been prepared for four of the regional outlook conferences to show publications that are available and how they are related to each other.

NEW CURRENT PUBLICATIONS

A number of current publications of special interest to the dairy industry have been started. These include a monthly mimeographed report on Milk Production Trends, which presents the results of crop estimates reports on milk production and carries this information to farmers who are reporting on this subject. A Statistical Supplement on Milk Production is being issued for technical workers, crop statisticians, and others. A series of monthly World Survey Reports dealing with butter was begun. These special reports, together with what has previously been issued, make possible a much more comprehensive presentation of the facts on the dairy industry than has heretofore been available.

The issuance of information in the form of mimeographed reports for immediate use continues to expand. Over 225 mimeograph reports were handled during the past year. The editions of these ranged from a few hundred to several thousand, making a total of about 350,000 copies. These are distributed chiefly to specialists, extension workers, teachers, and research workers. By this method the results of research are made available promptly.

PRINTED PUBLICATIONS

The bureau contributed 48 publications to the regular department series of publications, 15 manuscripts were being prepared for publication at the end of the year, and a number of preliminary reports were issued.

There was an increase in the number of articles prepared by members of the technical staff for outside publication. The number of radio talks given exceeded that of any previous year.

RELEASES TO THE PRESS

The bureau organization has continued to increase its contacts with newspapers and farm papers. During this period, when the press has had difficult conditions to meet, the opportunity to secure the publication of official information has been unusually good. Every effort has been made to meet all requests from editors with suitable releases or special articles.

Special market articles are prepared for about 65 publications, such as leading farm papers and rural editions of important newspapers, which have an aggregate circulation of between 9,000,000 and 10,000,000. In this service, about 15 different regular weekly articles are prepared and 5 monthly features, and copies are distributed by leased wire or mail to reach the publications exactly at closing date. Each is prepared to include as much material as possible of interest to farmers in the region covered by the periodical using it. Comments from editors have been universally enthusiastic.

MARKET NEWS BY RADIO

The dissemination of market information by radio is now regarded by a large number of producers as essential to good marketing. Radio market news has become stabilized during the past year or two, and it appears to be less subject to change than it was in the early stages. The principal service to growers and shippers is through the release of market reports from various branch offices of the market news system to the local radio stations. By this means market information bearing on the truck crops that the producers are shipping reaches them promptly. Such releases, covering cotton, grains, fruits and vegetables, dairy and poultry products, and livestock, meats, and wool, are being broadcast regularly to more than 100 stations.

Supplementing the current price information, principally of local origin, the chain broadcasting program of the bureau furnishes a general situation review which is of much practical value to farmers. This chain program now covers the country. The broadcasting from the national chain at Washington has been supplemented by that from a chain originating at San Francisco and covering the Pacific and Mountain States. On this chain there are now regular monthly reviews covering principal crops and livestock, as well as special broadcasts on conditions through the season. These reviews have been pronounced of particular value by extension workers as a supplement to their work on the outlook, marketing, and farm management. The bureau furnishes a large proportion of the talks and the speakers in this service.

The department Radio Service manuscripts for broadcasting by local stations have provided an outlet for an increased volume of timely material. This information is used by about 40 stations. The bureau has contributed about 50 talks and lectures to this series. During the year an unusual number of emergency discussions were added, dealing with the drought and crop-adjustment campaigns.

NEW ECONOMIC EXHIBITS

The exhibit work of the bureau was expanded during the year. A special bureau display on wool utilization was built and was shown at a number of large fairs, expositions, and sheep raisers' conventions in the principal wool-producing territories. This created such favorable comment that a department exhibit was planned and constructed, to be used during the forthcoming season. For the first time the department has a comprehensive display relating to sheep and wool, including several units which present distinctly economic information dealing with the outlook, grades of wool, and wool utilization.

A department committee was appointed to prepare a similar departmental display relating to cotton, and the bureau has made plans for several economic units in this series.

To supply a need for a light portable type of demonstration material to be used at small conventions, the series of portfolios which may be shipped by parcel post has been expanded by the addition of new collections covering fruits and vegetables, dressed poultry, meats, etc. These portfolios are used on occasions where the larger departmental exhibits can not be handled.

Bureau representatives assisted in the presentation of exhibits at about 12 important fairs and expositions in cooperation with the department Office of Exhibits. The bureau also prepared displays for the International Livestock Exposition, National Dairy Exposition, the Textile Show, and the State fair circuits.

ECONOMIC-CHART SERVICE

With the rapid expansion of extension work in agricultural economics, the demand for charts for extension work has continued to expand. The series of outlook-chart books have been revised and reissued and a total of 5,300 copies has been distributed to outlook workers.

The use of wall charts 30 by 40 inches has also been greatly extended. Over 1,800 charts of this sort have been made and sold at cost to extension workers and others. One special edition of 1,200 charts was prepared for use in the cotton-outlook campaign in the Southern States. Through reproduction by rotaprint, thousands of prints of charts have been used in various bureau releases and in special publications for extension work.

MARKET LEGISLATION SERVICE

In cooperation with the National Association of Marketing Officials the market legislation service has been continued. Reviews of current changes in State and Federal laws have been prepared for publication weekly in the mimeographed periodical Marketing Activities and upon special requests of various officials. A summary of market legislation was prepared for presentation at the annual meeting of this organization.

